Cheryl Bodiford McNeil
Lauren Borduin Quetsch
Cynthia M. Anderson
Editors

Handbook of Parent-Child Interaction Therapy for Children on the Autism Spectrum

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Cheryl B. McNeil
To my wonderful family, amazing doctoral students, brilliant mentors, passionate colleagues, and all of the struggling families referred to me for clinical care, thank you for inspiring me to explore new ways to make an impact in the field of children's mental health.

Lauren B. Quetsch
This book is dedicated to my husband, Tim, and my children, Layne and Connor, who bring joy and balance to my life. Their support and endless love shine a light on how important family is and how I am so lucky to dedicate my career to help others find that same light in their own families.

Cynthia Anderson
To the many individuals with autism spectrum disorder and their families that I have been lucky to work with and learn from, and to my incredible husband and son who keep me balanced and focused.

Foreword

According to the *Diagnostics and Statistical Manual, Fifth Edition* (DSM-5; American Psychiatric Association, 2013), autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social interaction and communication, as well as restricted and repetitive behaviors, interests, and activities. Recent estimates indicate that as many as 1 in 59 children in the United States have ASD (Centers for Disease Control, 2018). Many children with ASD present with comorbid behavior problems that many families feel underprepared to address.

In this handbook, we highlight Parent-Child Interaction Therapy (PCIT) as a promising treatment for complementing evidence-based ASD services. In recent years, approximately one dozen published PCIT studies have demonstrated positive outcomes with children on the autism spectrum. Because PCIT is intended to serve as a complementary treatment for other evidence-based approaches, we review those approaches in some depth.

PCIT is an empirically supported parent training program originally designed for young children (2 to 7 years) with disruptive behavior problems. The intervention has been demonstrated to be effective for children presenting with a variety of child mental health concerns including separation anxiety, trauma, ADHD, intellectual disability, and depression. PCIT is unique in that it involves in vivo coaching of parents while they interact with their child, and typically is conducted with the therapist/coach stationed behind a one-way mirror. Parent and child skills are coded and graphed in each session to assess progress toward established mastery criteria; these data are used to guide intervention decisions.

This book compiles the collective knowledge of both PCIT and ASD researchers to present a foundation for the utilization of PCIT for children with ASD. It is the hope of the editors that PCIT will become a standard component of the milieu of services for young children in this population. In PCIT, the first phase of treatment, Child-Directed Interaction, is intended to improve the caregiver-child relationship and increase the social reinforcement value of the parent. The second phase of treatment, Parent-Directed Interaction, typically yields large and rapid changes in disruptive behavior, with noticeable improvements in compliance after only a few weeks of receiving this intervention stage. Research demonstrates that a short course of PCIT (~11–22 sessions; M = 19 sessions) for children with ASD leads to significant reductions in behavior problems (as measured using the Eyberg Child Behavior Inventory—Intensity Scale; Eyberg

& Pincus, 1999) from outside normal limits (88th percentile) to within normal limits (34th percentile) and substantial improvements in child compliance (from 41% to 87%) (e.g., Zlomke, Jeter, & Murphy, 2017; $N = 17$). In this handbook, we argue that PCIT is most effective when provided early in the treatment process, either while waiting for intensive services (e.g., applied behavior analysis) to begin or concurrently with necessary interventions. For higher functioning children with disruptive behavior, PCIT can be conceptualized as a gateway intervention in that it systematically trains parents to quickly modify noncompliance, aggression, and tantrums and thereby improves the effects of other services often required by children on the autism spectrum (e.g., occupational therapy, speech therapy).

The handbook is broken into four sections. The first section of the book, "Conceptual Foundations of Evidence-Based Approaches for Autism Spectrum Disorder," provides an overview of the evidence-based interventions for children on the autism spectrum, all of which are derived from the science of behavior analysis. This section describes core characteristics of children with autism, the conceptual and scientific foundations of applied behavior analysis, effective models of treatment for youth with autism as well as unsubstantiated treatments for this population that are still present.

The second section of the book, "Evidence-Based Approaches to Treating Core and Associated Deficits of Autism Spectrum Disorder," reviews the evidence-based approaches to increase skills such as communication and social interaction and reduce problematic behavior such as self-injury or stereotypic behavior that interferes with learning. This is also includes a discussion of strategies for complex and challenging behaviors. The section concludes with specific and feasible recommendations for assessing potential treatments and determining whether a given intervention is both empirically supported and a good match for a particular child.

The third section of the handbook entitled "Parent-Child Interaction Therapy (PCIT) and Autism Spectrum Disorder: Theory and Research" gives an overview of PCIT, the theory behind using PCIT with an ASD population, and preliminary studies using PCIT for children with ASD. A training requirements chapter rounds out this section by detailing the steps needed to become a PCIT therapist or trainer, and the recommended qualifications or additional education needed by PCIT therapists who intend to work with ASD populations. This section elucidates the foundational principles and mechanisms through which PCIT has achieved such powerful effects with disruptive behavior (e.g., Cohen's d's of well over 1.0) for children with ASD.

The final section of the book focuses on clinical considerations when using PCIT for children on the autism spectrum. Adaptations for treatment implementation are highlighted as researchers and clinicians work to address the unique needs of these families and children. Considerations are presented for implementing this treatment based on the level of autism severity and comorbid conditions. Using a quick-reference, outline format, the final chapter (McNeil & Quetsch) brings together the most salient clinical takeaway messages from the handbook, providing numerous helpful hints for clinicians working with families of children on the spectrum. Additionally,

the final chapter provides information regarding a novel Social-Directed Interaction phase that can be added to the protocol to address core ASD symptomatology.

This handbook summarizes recommendations for using PCIT with children on the autism spectrum that are based upon a growing body of literature and hundreds of clinical cases. It is our hope that this book will encourage current PCIT providers to expand their referral base to include children on the autism spectrum. We also hope that this handbook sparks interest in the community of providers using traditional treatments with young children on the autism spectrum to learn more about PCIT and consider including the service as part of an empirically supported continuum of care.

Given that caregivers report that their greatest source of parenting stress is the aggression, noncompliance, and tantrums often associated with autism, a short course of PCIT could enhance family wellness with quick, and often dramatic, improvements in disruptive behavior. In this way, PCIT could be an important preventive approach to reduce behavior problems and dysfunctional parent-child interaction patterns that can occur when families have little specialized training in how to parent children on the spectrum. Our vision is to develop a network of providers and researchers with expertise in PCIT-ASD who can provide and evaluate the impact of this treatment as a standard component of a "best practice" continuum of care. Ultimately, we hope to make PCIT readily available as a resource for families with young children on the autism spectrum.

Acknowledgments

This book is the embodiment of a lifelong dedication to young children and families across a number of incredible clinicians and researchers. In turn, this book would not have been possible without their tireless efforts to understand the unique needs of families who are often overlooked or misunderstood. We would like to thank our colleagues for lending their minds to help us build a foundation for clinical understanding while continuing to question our preconceptions about autism spectrum disorder. In turn, our colleagues in the PCIT community have been essential in helping us piece together the puzzle of adapting an evidence-based treatment to address the complex needs of children with ASD.

Specifically, we would like to thank Dr. Sheila Eyberg, the founder of PCIT, for developing this powerful and caring approach to helping families. Thanks also to Dr. Joshua Masse for his willingness to conduct pioneering research in the area of PCIT with ASD while a doctoral student at West Virginia University. To the ABA researchers and clinicians who developed the best practices in this field, we are grateful for your technological discoveries about behavior modification and communication training that are infused in this work. Thanks also to all of our overworked chapter authors who performed under tight deadlines to provide an important service to the profession. And, lastly, this book is dedicated to the loving families who have put their trust into our hands as we explored a new approach to working with young children on the autism spectrum. Please know that we send you a heartfelt "thank you" for informing all that is written in this text.

Contents

Part I Conceptual Foundations of Evidence-Based Approaches for Autism Spectrum Disorder

1 What Is Autism Spectrum Disorder? 3
Hannah Rea, Krysta LaMotte, and T. Lindsey Burrell

2 Applied Behavior Analysis: Foundations and Applications . . . 27
Stephanie M. Peterson, Cody Morris, Kathryn M. Kestner, Shawn P. Quigley, Elian Aljadeff-Abergel, and Dana B. Goetz

3 Evidence-Based Models of Treatment 41
Regina A. Carroll and Tiffany Kodak

4 The Importance of Parent-Child Interactions in Social Communication Development and Considerations for Autism Spectrum Disorders 55
M. Alice Shillingsburg and Brittany Juban

5 Measuring the Effects of Medication for Individuals with Autism 71
Jennifer Zarcone, Annette Griffith, and Chrystal Jansz Rieken

6 Unsubstantiated Interventions for Autism Spectrum Disorder 87
Yannick A. Schenk, Ryan J. Martin, Whitney L. Kleinert, Shawn P. Quigley, and Serra R. Langone

Part II Evidence-Based Approaches to Treating Core and Associated Deficits of Autism Spectrum Disorder

7 Behavioral Approaches to Language Training for Individuals with Autism Spectrum Disorder 109
Jason C. Vladescu, Samantha L. Breeman, Kathleen E. Marano, Jacqueline N. Carrow, Alexandra M. Campanaro, and April N. Kisamore

8 Behavior Analytic Perspectives on Teaching Complex Social Behavior to Children with Autism Spectrum Disorder 129
April N. Kisamore, Lauren K. Schnell, Lauren A. Goodwyn, Jacqueline N. Carrow, Catherine Taylor-Santa, and Jason C. Vladescu

9 Assessment and Treatment of Stereotypical Behavior Displayed by Children with Autism Spectrum Disorders 147
Jennifer L. Cook, John T. Rapp, and Kristen M. Brogan

10 Functional Analysis and Challenging Behavior 169
Kathryn M. Kestner and Claire C. St. Peter

11 Function-Based Interventions for Problem Behavior: Treatment Decisions and Feasibility Considerations 189
Sarah A. Weddle and Abbey B. Carreau

Part III Parent–Child Interaction Therapy (PCIT) and Autism Spectrum Disorder: Theory and Research

12 Mapping PCIT onto the Landscape of Parent Training Programs for Youth with Autism Spectrum Disorder 219
Karen Bearss

13 A Clinical Description of Parent-Child Interaction Therapy 237
Paul Shawler and Beverly Funderburk

14 PCIT: Summary of 40 Years of Research 251
Laurel A. Brabson, Carrie B. Jackson, Brittany K. Liebsack, and Amy D. Herschell

15 Theoretical Basis for Parent-Child Interaction Therapy with Autism Spectrum Disorder 277
Desireé N. Williford, Corey C. Lieneman, Cassandra R. Drain, and Cheryl B. McNeil

16 Parent-Child Interaction Therapy with Children on the Autism Spectrum: A Narrative Review 297
Christopher K. Owen, Jocelyn Stokes, Ria Travers, Mary M. Ruckle, and Corey Lieneman

17 Child-Adult Relationship Enhancement for Children with Autism Spectrum Disorders: CARE Connections 321
Robin H. Gurwitch, Melanie M. Nelson, and John Paul Abner

18 Core Training Competencies for PCIT and ASD 339
Christina M. Warner-Metzger

Part IV Clinical Considerations in Using PCIT for ASD

19 Autism Spectrum Disorder and Family Functioning: A Therapist's Perspective 351
Susannah G. Poe and Christopher K. Owen

20 Sleep Concerns in Children with Autism Spectrum Disorder 363
Jenna Wallace, Jodi Lindsey, Victoria Lancaster, and Meg Stone-Heaberlin

21 Autism Spectrum Disorder and Attachment: Is an Attachment Perspective Relevant in Early Interventions with Children on the Autism Spectrum? 373
Sara Cibralic, Christopher K. Owen, and Jane Kohlhoff

22 Helping Parents Generalize PCIT Skills to Manage ASD-Related Behaviors: Handouts and Clinical Applications 399
Catherine A. Burrows, Meaghan V. Parladé, Dainelys Garcia, and Jason F. Jent

23 PCIT and Language Facilitation for Children with Autism Spectrum Disorders 425
Brenda L. Beverly and Kimberly Zlomke

24 Summary of Lessons Learned from Two Studies: An Open Clinical Trial and a Randomized Controlled Trial of PCIT and Young Children with Autism Spectrum Disorders 443
Ashley Tempel Scudder, Cassandra Brenner Wong, Marissa Mendoza-Burcham, and Benjamin Handen

25 Melding of Two Worlds: Lessons Learned about PCIT and Autism Spectrum Disorders 457
Joshua J. Masse and Christina M. Warner-Metzger

26 Clinical Application of Parent-Child Interaction Therapy to Promote Play and Vocalizations in Young Children with Autism Spectrum Disorder: A Case Study and Recommendations 483
M. Alice Shillingsburg, Bethany Hansen, and Sarah Frampton

27 Reflections on the First Efficacy Study of Parent-Child Interaction Therapy with Children Diagnosed with Autism Spectrum Disorder 501
Susan G. Timmer, Brandi Hawk, Megan E. Tudor, and Marjorie Solomon

28 Lessons Learned from the Application of Parent-Child Interaction Therapy with Children with Autism Spectrum Disorder 517
Heather Agazzi, Kimberly Knap, Sim Yin Tan, and Kathleen Armstrong

29 PCIT for Children with Severe Behavior Problems and Autism Spectrum Disorder 531
Korrie Allen, John W. Harrington, and Cathy Cooke

30 Internet-Delivered Parent-Child Interaction Therapy (I-PCIT) for Children with Autism Spectrum Disorder: Rationale, Considerations, and Lessons Learned 545
Natalie Hong, Leah K. Feinberg, Dainelys Garcia, Jonathan S. Comer, and Daniel M. Bagner

31 What PCIT Clinicians Need to Know About ASD Assessment 559
Stacy S. Forcino and Cy B. Nadler

32 Child-Directed Interaction Treatment for Children on the Autism Spectrum 575
John Paul Abner, Leah N. Clionsky, and Nicole Ginn Dreiling

33 Parent-Directed Interaction: Considerations When Working with Young Children with Autism Spectrum Disorders 589
Ashley Tempel Scudder, Stephanie Wagner, and Paul Shawler

34 Parent-Child Interaction Therapy with a Child on the Autism Spectrum: A Case Study 609
Nancy M. Wallace and Holly Glick Sly

35 A Case Study of Parent-Child Interaction Therapy with Adaptations for the Treatment of Autism Spectrum Disorder in Early Childhood 619
Heather Agazzi, Sim Yin Tan, Kimberly Knap, and Kathleen Armstrong

36 PCIT and Autism: A Case Study 633
Amelia M. Rowley and Joshua J. Masse

37 Parent-Child Interaction Therapy (PCIT): Autism Case Study #4 651
Dorothy Scattone, Dustin E. Sarver, and Amanda D. Cox

38 Parent-Child Interaction Therapy-Toddler (PCIT-T): Case Overview for a Child on the Autism Spectrum with a Comorbid Developmental Disability 665
Victoria E. Montes-Vu and Emma Girard

39 Parent-Child Interaction Therapy for a Child with Autism Spectrum Disorder: A Case Study Examining Effects on ASD Symptoms, Social Engagement, Pretend Play, and Disruptive Behavior 677
Corey C. Lieneman, Mary M. Ruckle, and Cheryl B. McNeil

40 Putting It Together: Takeaway Points for Clinicians Conducting PCIT with Autism Spectrum Disorder 697
Cheryl B. McNeil and Lauren B. Quetsch

Appendix A 735

Index 743

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Cheryl, Bodiford, McNeil, Ph.D. is a Professor of Psychology in the Clinical Child program at West Virginia University. Her clinical and research interests are focused on program development and evaluation, specifically with regard to adapting treatments and managing disruptive behaviors of young children in both the home and school settings. Dr. McNeil has coauthored several books (e.g., *Parent-Child Interaction Therapy, Second Edition, Short-Term Play Therapy for Disruptive Children, Parent-Child Interaction Therapy with Toddlers: Improving Attachment and Emotion Regulation*), a continuing education package *(Working with Oppositional Defiant Disorder in Children*), a classroom management program (*The Tough Class Discipline Kit*), and a Psychotherapy DVD for the American Psychological Association (*Parent-Child Interaction Therapy)*. She has a line of research studies examining the efficacy of Parent-Child Interaction Therapy and Teacher-Child Interaction Training across a variety of settings and populations, including more than 100 research articles and chapters related to the importance of intervening early with young children displaying disruptive behaviors. Dr. McNeil is a master trainer for PCIT International and has disseminated PCIT to agencies and therapists in many states and countries, including Norway, New Zealand, Australia, Taiwan, Hong Kong, and South Korea.

Lauren Borduin Quetsch, M.S. will complete her doctoral degree in the Clinical Child Psychology program at West Virginia University in 2019 under the mentorship of Dr. Cheryl B. McNeil. Mrs. Quetsch's research interests include the dissemination and implementation of evidence-based treatments (EBTs) in community settings as well as the adaptation of EBTs for young children with severe behavioral problems. As a research associate at West Virginia University, Mrs. Quetsch already has more than 20 publications and plans to continue in a research-focused faculty position after graduating from West Virginia University and completing her internship.

Cynthia M. Anderson, Ph.D., B.C.B.A.-D. is the Senior Vice President of Applied Behavior Analysis for the May Institute. She holds a joint appointment as the Director of the May Institute's National Autism Center. Dr. Anderson provides consultation and support to clinical staff supporting individuals exhibiting challenging behavior such as self-injury, aggression, and property destruction. In addition, she also promotes research in and

dissemination of evidence-based practices through the National Autism Center. Dr. Anderson received her Ph.D. in Clinical-Child Psychology from West Virginia University. She is a licensed psychologist and a Board Certified Behavior Analyst at the doctoral level. Dr. Anderson currently serves as the Applied Representative on the Executive Council of the Association for Behavioral Analysis International and is the Representative at Large for Division 25 of the American Psychological Association. She has provided editorial support to numerous journals including serving as Associate Editor for *School Psychology Review* and *Journal of Behavioral Education*, and on the editorial boards of the *Journal of Applied Behavior Analysis*, *The Behavior Analyst*, and other journals.

Part I

Conceptual Foundations of Evidence-Based Approaches for Autism Spectrum Disorder

What Is Autism Spectrum Disorder?

1

Hannah Rea, Krysta LaMotte, and T. Lindsey Burrell

Abstract

Autism spectrum disorder (ASD) is a neurodevelopmental disorder with social-communication deficits and restricted and/or repetitive behaviors and/or interests. The diagnostic criteria of the disorder have evolved over the years with new research on the features, associated symptoms, prevalence, and etiology of the disorder. This chapter offers an overview of the presentation, development, history, prevalence, and impact of ASD on the child and family. Research on the etiology of ASD, including potential risk factors and dispelled myths, is summarized.

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1.1 The Diagnosis and Presentation of Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a neurodevelopmental disorder associated with deficiencies or excesses in two domains: social-communication and restricted, repetitive behaviors and interests (American Psychiatric Association [APA], 2013). Social-communicative skills and restricted and repetitive behaviors and interests vary across individuals with and without a diagnosis of ASD. These distinct domains can be atypical or normative depending on where an individual falls within the spectrum of the behavior. Behaviors of individuals with ASD and normative samples are etiologically and qualitatively related; however, individuals who do not meet the criteria for ASD may not demonstrate abnormalities in those domains, may exhibit abnormalities in a single domain, or may display minimal difficulties in both domains (Constantino & Todd, 2003). Individuals with ASD must exhibit impairment in social-communication and restricted, repetitive behavior and interest, but they are heterogeneous in presentation and severity of impairment. The purpose of this chapter is to describe the history and presentation of ASD by introducing the diagnostic criteria, common presentation and development of the disorder and comorbidities in children, and risk factors that contribute to the disorder.

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1.1.1 Diagnostic Criteria

The diagnostic criteria for ASD that are most commonly used by clinicians in the United States are derived from the American Psychiatric Association's Diagnostic Statistical Manual, Fifth Edition (DSM-5 2013). The DSM-5 states that ASD impairments in the domain of social-communication include failure to initiate and/or reciprocate emotional and social exchanges, abnormalities in nonverbal communication behavior and understanding, and/or difficulties forming and sustaining relationships. The DSM-5 criteria for restricted interests and repetitive behavior include the presentation of at least two or more of the following: stereotyped or repetitive movements or speech (e.g., flapping arms back and forth or repeating the same sentence/phrase), rigidity in routine, abnormalities in domain or intensity of interests, and/or abnormalities in reactivity to sensory input (APA, 2013). Despite these specific diagnostic criteria, consistency in presentation across and within individuals and reliability of diagnosis are fairly low (Falkmer, Anderson, Falkmer, & Horlin, 2013) depending on developmental period, severity of impairment, and genetic, medical, and psychosocial comorbidities, which are described below. See Table 1.1 for diagnostic criteria and examples.

1.1.1.1 Social-Communication Deficits

Social-communication deficits or excesses are often the first sign of ASD, and can appear within the first year of a child's life (Guthrie, Swineford, Nottke, & Wetherby, 2013; Richler et al., 2006; Sacrey et al., 2015). Early social-communication difficulties may include abnormalities in the use of nonverbal expressive and receptive communication, such as gestures and imitation of facial expressions. Before children can speak, most neurotypical children try to communicate with caregivers by pointing or reaching for things. When neurotypical infants see an object of interest, they may engage in joint attention by looking to the object, then the caregiver, and then back at the object, as if to direct their caregiver's attention to the item of interest (Baron-Cohen, Leslie, & Frith, 1985). When their caregiver points or looks at something, the infant likely follows the direction of the point. Similarly, when the caregiver smiles, the infant likely reciprocates the behavior and smiles back.

For children with ASD, however, many of those social and communicative behaviors are atypical or absent. Many children with ASD do not engage their parents in acts of joint attention, and may not attempt to gain a caregiver's attention (Charman, 2003; Macari et al., 2012), for example, by pointing or gesturing (Macari et al., 2012). Additionally, some children with ASD lack imitation skills (see review in Jones, Gliga, Bedford, Charman, & Johnson, 2014). For example, if a parent shakes a rattle or puts blocks together, a child with ASD may not imitate those behaviors. Other atypical behaviors include avoiding looking at faces, glancing at a face quickly, or focusing on parts of the face that do not communicate emotions (Jones et al., 2014). Because infants learn language, communication, and social behaviors through joint attention and imitation (e.g., Charman, 2003), infants and young children with deficits in these areas may miss valuable learning opportunities, which may contribute to more significant and more pronounced impairments at a later age (Dawson, 2008).

As children grow, neurotypical children begin to display interest in and then seek out peers to play with. Some children with ASD seem to avoid social play opportunities, whereas others may desire relationships but do not know how to initiate or maintain them. Such a child may hover on the outskirts of a peer group, but not ever integrate into the group, even when invited to do so. Some children with ASD spend more time in solitary play, even when peers are present (Zager, Cihak, & Stone-MacDonald, 2017), while other children with ASD may attempt to play with peers but do not exhibit the foundational social skills necessary to engage in reciprocal play behavior. For example, a child with ASD may not be skilled in sharing or turn-taking or may not pick up on verbal and nonverbal cues that guide interaction and indicate how a game should be played. A child with ASD may not understand the

Table 1.1 DSM-5 diagnostic criteria and examples

Domain	Diagnostic criteria	Examples
Social-communication Deficits	Failure to initiate and/or reciprocate emotional and social exchanges	• Looks down when someone says, "Hi" • Responds to a peer's description of weekend activities with an off-topic monologue
	Abnormal nonverbal communication behavior and understanding	• Avoids eye contact • Facial expressions and/or tone of voice seem flat or robotic
	Difficulties forming and sustaining relationships	• Plays alone instead of with others • Avoids physical touch
Restricted, repetitive interests, behaviors, and activities (at least two)	Stereotyped or repetitive movements or speech	• Flaps hands repeatedly • Organizes toys instead of playing with them
	Rigidity in routine	• Throws a tantrum when a stop is added on the typical drive home • Insists on looking in every window he or she passes by
	Abnormalities in domain or intensity of interests	• Talks almost exclusively about a collection of old video game consoles • Stares at the wheel of a toy car, instead of the whole car
	Abnormalities in reactivity to sensory input	• Cries when in a place with bright lights or loud noises • Does not show a reaction to a sudden loud noise, like an alarm or clap of thunder

concept of a "do-over" and may become frustrated at the perception that another child is not following the rules. This unawareness or failure to comply with social norms can lead to peer rejection (Schroeder, Cappadocia, Bebko, Pepler, & Weiss, 2014).

Another key skill that most children with ASD lack is often labeled theory of mind (Baron-Cohen et al., 1985). Theory of mind is the ability to perceive or understand other people's perspectives (Wellman, Cross, & Watson, 2001). Children with ASD are typically more concrete and often misinterpret others' behaviors and miss important social cues. For example, children with ASD may not realize that it is inappropriate to enter into a conversation with a group of individuals who are talking to one another in a heated or an animated manner or may make a factual statement about another person that may be hurtful without considering the other person's feelings. Children with ASD may also struggle to understand facial expressions and the cause of others' emotions. For example, a child with ASD may, along with peers, learn that another child in the class was seriously injured. Most peers may cry or otherwise express distress yet the child with ASD may appear unaffected and may even question the behavior of peers, "Why are they crying?" (Bauminger, 2002). Many also struggle to identify, cope with, and appropriately express their own emotional states. For example, some children with ASD may not identify their feeling as "angry" despite yelling, hitting, and clenching their fists (Mazefsky, Borue, Day, & Minshew, 2014).

Additionally, many children with ASD struggle during play due to deficits in imitation, understanding of symbolism (i.e., use of objects, actions, or ideas to represent other objects, actions, or ideas; Prizant, Wetherby, Rubin, & Laurent, 2003), imagination, and social understanding (Bauminger, Shulman, & Agam, 2003). Most preschoolers engage in imaginative and symbolic play, such as pretending to make dinner in a toy kitchen and using the toy stove to "cook." However, a child with ASD who has limited imitation or creative play may not know how to join the play. When children with ASD avoid, learn to avoid, or are rejected from play and social experiences, they miss important modeling and learning opportunities, which may exacerbate their deficits (Dawson, 2008). Children with ASD's social difficulties are further compounded by excessive repetitive and restricted behaviors, interests, and activities, which may also impact their social engagement and opportunities.

1.1.1.2 Repetitive and Restricted Behaviors, Interests, and Activities

Repetitive and restrictive behaviors often become most apparent when a child begins to play with toys independently and develop language. There is some research reporting repetitive and restrictive behaviors in children with ASD by the second year of life (e.g., Wetherby et al., 2004), while other studies report that those behaviors only become atypical later in childhood (e.g., Werner & Dawson, 2005). The presentation, assessment, and treatment of repetitive and restricted behaviors, interests, and activities will be covered in greater depth in Chap. 9, so they are only briefly reviewed here.

Some repetitive and restricted behaviors change as children develop, as interests and skills change. For example, a young child may repeatedly line up blocks or other toys instead of building or playing with them, and then, in later years, begin to insist that his or her clothes be hung in a particular manner and that other precise organizational patterns are followed (Watt, Wetherby, Barber, & Morgan, 2008). Stereotyped behaviors can also appear in the use of language, such as repeating one word or phrase (echolalia) or only repeating information on one topic that is of interest to them, which may also make the individual seem "rigid" (APA, 2000).

Children with ASD can also exhibit rigidity in their adherence to routines, social flexibility, and understanding of rules. For example, some children with ASD have trouble adapting to unexpected changes to schedules. Some may become upset when other children want to invent new games or alter the rules in games because they do not understand that some rules can be flexible (Hobson, Lee, & Hobson, 2008). Children with

ASD may also display rigid and atypical interests such as in the mechanics of toys, rather than the function (Ozonoff et al., 2008). For example, while neurotypical children might roll a toy car on the floor and make car noises such as the noise of a horn, a child with ASD might be more likely to play with a toy car by staring at the spinning wheels, repeatedly opening and shutting the hood, or lining up all the toy cars in a row. Children with ASD may have very restricted interests, such as exclusive focus on batting averages in major league baseball, or in types and functions of different vacuum cleaners. Some children become focused on very specific environmental stimuli, such as a moving ceiling fan or reflections in car windows. Vocal children with ASD may focus most or all conversation on their restricted interests and fail to pick up on signals that their conversational partner has lost interest in the topic.

In addition to stereotyped behavior and restricted interests, many children with ASD have abnormal reactions to sensory stimuli that are considered repetitive and restricted behaviors (APA, 2013). Some children with ASD are hypersensitive to sensory experiences, such as reacting negatively to loud noises, bright lights, strong tastes, or physical touch. In contrast, some children with ASD are hyposensitive to sensory stimuli. This is referred to as sensory under responsivity and often manifests as failure to exhibit discomfort or to communicate pain (Hazen, Stornelli, O'Rourke, Koesterer, & McDougle, 2014). For example, a child with ASD may show no reaction when he or she bangs his or her head on the table yet demonstrate clear indicators of pain when he or she trips and falls. Some children with ASD don't react to even extreme temperatures, such as seeming not to be cold even when the temperature is quite low. Other children may not react to loud and sudden noises, even when the noise was so extreme that everyone around exhibits a startle response. As with other domains, the response to environmental stimuli is variable among children with the same diagnosis.

The range in presentation of DSM-5 criteria alone demonstrates the heterogeneity within the disorder. Deficits in both core domains can affect movement, speech, interests, and reactions, and children with ASD can present with any combination of types or presentations of abnormalities. Further contributing to differences in presentations is a variety of deficits that are commonly associated with ASD diagnoses.

1.1.2 Associated Deficits and Abnormalities

While not part of the diagnostic criteria, children with ASD often exhibit a range of cognitive, linguistic, and adaptive living deficits, as well (Ousley & Cermak, 2014). Deficits in these other domains are not currently included as core deficits in the diagnosis of ASD because it is unclear if they are caused by comorbid disorders, if they overlap with other disorders because the disorders are related, or if they are more central deficits of ASD (Mazefsky et al., 2014). These commonly co-occurring impairments are noteworthy as they affect presentation and treatment.

1.1.2.1 Cognitive Impairments

Both global cognitive functioning and specific cognitive abnormalities are common in children with ASD but there is no singular cognitive profile (Joseph, Tager-Flusberg, & Lord, 2002). Global cognitive ability can range from intellectual impairment to above-average intelligence, as will be discussed more in the section on comorbidities. But, even children with ASD with above-average intelligence often exhibit some specific cognitive deficit. Common cognitive abnormalities in this population include deficits in executive functioning, a bias towards details instead of the larger picture, the ability to process large amounts of information, cognitive flexibility, and learning and processing speed (DeMyer, Hingtgen, & Jackson, 1981; Minshew & Williams, 2007). Deficits in executive functioning will be reviewed more in the section on comorbidities because they often result in a diagnosis of attention-deficit hyperactivity impulsivity (ADHD) disorder, but the deficits may include problems with working memory and the ability to

inhibit impulses, organize, plan, and execute strategies (Ozonoff & Stayer, 2001). All of these problems can make it difficult for children with ASD to organize large amounts of information together or to break large amounts of information down into manageable parts.

Relatedly, a bias towards focusing on details may make it hard for the child to take a broad perspective or to learn and process large amounts of information (Happé & Frith, 2006). Some children with ASD exhibit superior processing of details, such as the ability to detect modifications to melodies in music (Mottron, Peretz, & Ménard, 2000) or faster performance on spatial tasks, like map learning, because they have a preference for processing details (Caron, Mottron, Rainville, & Chouinard, 2004). The preference for details can be a strength that helps the child excel in fields that value details, like mathematics, engineering, or music. The processing bias can also detract from the child's perception of the larger picture, in some instances. It remains unclear if these children with ASD have true deficits in global processing, or if their global processing is just negatively impacted by the focus on details sometimes, but bias towards details should be considered as it can affect the child's social, emotional, and cognitive behaviors (Happé & Frith, 2006). The focus on details is not present in all children with ASD and given the heterogeneity in cognitive ability within and between children with ASD in all cognitive domains it is important to assess each individual's relative strengths and weaknesses to ascertain where they may excel and where they may need additional support.

1.1.2.2 Linguistic Deficits

Many children with ASD also need support and early intervention due to linguistic deficits beyond social-communication abnormalities (Kim, Paul, Tager-Flushberg, & Lord, 2014). A majority of children with ASD develop expressive and receptive language (Norrelgen et al., 2014), but they do so later and at a slower rate than neurotypical children do (Kim et al., 2014). Some children with ASD have relatively normal language development but make grammatical errors or exhibit abnormalities in prosody (speech rhythm, stress, and intonation; Charman, Drew, Baird, & Baird, 2003; Eigsti, de Marchena, Schuh, & Kelley, 2011). Finally, some children with ASD do not develop spoken communication or phrase speech at all (Kim et al., 2014; Norrelgen et al., 2014).

For children with ASD who do develop spoken communication, they may exhibit deficits in expressive language, receptive language, or both. Early signs of deficits and delays in receptive language include failure to respond to the sound of one's name (Nadig et al., 2007) or a mother's voice in infancy (Klin, 1991), and lack of understanding of instructions at an older age. Expressive language delays include a delayed average age of first word production; the average is 38 months for children with lower functioning ASD, compared to an average age of 8–14 months for neurotypical children (Howlin, 2003). Additionally, some toddlers and children with ASD produce noises that are inappropriate in content, volume, or clarity and some exhibit echolalia, or repetition of others' words, phrases, and/or intonation (Kim et al., 2014).

Other linguistic errors and oddities can be seen in children with ASD and language delays or normal language development (Kim et al., 2014). Some children make speech and grammatical errors, such as incorrect articulation of consonants (Shriberg et al., 2001), misuse of personal pronouns (e.g., "she wants water" instead of "I want water"), or make errors in other syntactical rules (Kim et al., 2014). These deficits may be related to cognitive ability, too, however (Eigsti et al., 2011). Some children also exhibit prosody oddities, like flat affect or tone (Diehl & Paul, 2013; Lord & Paul, 1997), misplaced stress, slowed phrasing (Shriberg et al., 2001), and/or inappropriate volume and alternation between volumes (Shriberg, Paul, Black, & Van Santen, 2011). These speech oddities can also affect comprehension, as children with ASD may have trouble understanding others' intonations, prosody marks of questions, or emotion, or they may struggle to integrate knowledge and context with verbal stimuli (Diehl & Paul, 2013; Kim et al.,

2014). Again, there is heterogeneity in the domain of deficits and many of these deficits only apply to subsets of children with ASD.

As noted above, and contributing to heterogeneity in presentation, a subset of children with ASD do not develop spoken communication. Some children never develop spoken communication while others may have initially talked, and then ceased to do so. Cases of "regression," or lost skills, are commonly reported in the media, but, because studies are largely based on retrospective reports, more research is needed to examine the validity of these reports (Thurm, Powell, Neul, Wagner, & Zwaigenbaum, 2017). Importantly, many children who do not use spoken communication may be taught to communicate using sign language, pictures, or other methods of augmentative communication (Paul, 2009). For more information on teaching communication, see Chaps. 7 and 8.

1.1.2.3 Adaptive Functioning Deficits

In addition to the deficits that may disrupt social engagement, children with ASD may have motor delays and may be less likely to independently engage in daily living skills. The impairments in communication and social skills previously described likely contribute to adaptive skill deficits. Neurotypical children usually exhibit adaptive living skills that are aligned with their verbal or intellectual ability, but children with ASD may not (Klin et al., 2007). Children with ASD's adaptive functioning skills are often significantly below their measured cognitive ability (Kanne et al., 2011). The discrepancy between IQ and adaptive functioning is especially pronounced among individuals with high-functioning ASD, who often do not show improvements in adaptive living skills that are comparable to same-aged peers (Klin et al., 2007). These adaptive functioning deficits may manifest as an inability to independently dress, develop appropriate sleep hygiene, become toilet trained, or complete chores. Motor deficits often include difficulties with gross motor skills, like running or jumping, and fine motor abilities, like holding a pencil or tying shoes (Volkmar, 2013). Adaptive skills affect the everyday functioning of children with ASD across contexts including home, school, and the community.

In sum, children with ASD exhibit a wide array of difficulties in the two core domains that distinguish the diagnosis from others, but they also may demonstrate deficits in other areas, including cognition, language, emotion, and adaptive functioning. No two children with ASD have the same strengths, weaknesses, or presentations because even if they technically meet similar diagnostic criteria, the presentation and severity vary drastically. As our understanding of the presenting problems and the relation between deficits change, so too do the diagnostic criteria and diagnostic considerations. Many of the DSM-5 diagnostic criteria relate to the original case studies on ASD, but much of our understanding has and continues to change.

1.2 History

The current diagnostic criteria for ASD represent a historical development from the first case studies. ASD was first described in case studies by two independent researchers, Leo Kanner and Hans Asperger. In 1943, Austrian-American psychiatrist Leo Kanner met a 5-year-old child who took no interest in people around him, liked to spin around in circles, and threw tantrums when his typical schedule was interrupted (Kanner, 1943; Morrier, Hess, & Heflin, 2008). This case inspired Kanner to conduct 11 case studies, which he compiled into his groundbreaking paper, *Autistic Disturbances of Affective Contact* (1943). Kanner's paper was the first to differentiate "infantile autism" from "childhood schizophrenia," arguing this disorder was not "a departure from an initially present relationship" (p. 242). Rather, it was an "extreme autistic aloneness" (p. 242) in which the child does not respond to anything in the outside world. Kanner stated that the fundamental marker of autism was the "children's inability to relate themselves in the ordinary way to people and situations from the beginning of life" (Kanner, 1943 p. 242).

One year after Kanner's publication, Hans Asperger independently wrote about a

comparable, yet higher functioning disorder that he called "autistic psychopathy." Asperger similarly described children with social impairments and repetitive and restrictive interests and behaviors, but the children in his case studies had average language ability and above-average intelligence. Asperger was also the first to note abnormalities in nonverbal communication, describing behaviors such as a lack of eye contact and oddities in speech tone (Frith, 1991). Asperger also distinguished the children he observed from those with "childhood schizophrenia, noting that children with 'autistic psychopathy' did not have periods of normal development and their social impairments were stable, unlike children with schizophrenia" (Klin, 2011). While Asperger's case studies were eventually integrated with Kanner's in diagnostic systems, Asperger's work was largely lost until after World War II because he had published it in German in Austria during the war (Klin, 2011).

Kanner and Asperger both chose variants of the word "autism" and compared their findings to schizophrenia because that terminology and disorder were foci of the psychiatric literature at that time. In the early 1900s, schizophrenia included diagnostic criteria of egocentrism and social detachment that were called "autism" from the Greek root *autos,* or "self." Kanner and Asperger believed that their discoveries were separate from schizophrenia, but when "infantile autism" was entered into the World Health Organization's diagnostic system, the International Classification of Diseases (ICD), in 1967, it was considered a type of schizophrenia (Sasson, Pinkham, Carpenter, & Belger, 2010). Similarly, in the United States, the American Psychiatric Association's (APA) Diagnostic Statistical Manual (DSM) included "autistic" behaviors as a sign of childhood schizophrenia, but not a separate disorder (APA, 1968).

It was not until the 1970s that researchers distinguished autism from childhood schizophrenia. The distinction was made because autism and schizophrenia rarely occurred in the same families (Rutter, 1968) and had different developmental trajectories (Kolvin, 1971). These empirical findings led to a novel category of "Pervasive Developmental Disorders (PDD)" with a diagnosis of "autism" in the DSM-III in 1980 (Sasson et al., 2010). The criteria were later refined and expanded beyond Kanner's descriptions to include a required onset before the age of 3 of limited social responsiveness, language deficits, and/or "peculiarities," and "bizarre" environmental responses. The disorder was also distinguished from schizophrenia by requiring that individuals did not exhibit delusions, hallucinations, loose associations, or incoherence (APA, 1987).

The DSM-III diagnosis of autism did not capture all individuals who presented with similar characteristics, so PDD not otherwise specified (PDD-NOS) and Asperger's syndrome were added to subsequent versions of the DSM (Klin, 2011). A diagnosis of PDD-NOS was given when children did not meet full criteria for autism but still displayed impairing and distressing social, communication, and restrictive, repetitive behaviors (Ousley & Cermak, 2014; Volkmar, 2013). Asperger's syndrome was added to capture higher functioning cases of children who met the same criteria for social impairment and restricted, repetitive behaviors or interests as children with autism, but in the absence of language, cognitive, and adaptive behavior delays (APA, 1994). While the increase in diagnostic specificity and categories helped individuals receive the services and treatment they needed, it also led to a stark increase in the prevalence of diagnosed developmental disabilities (Zablotsky, Black, Maenner, Schieve, & Blumberg, 2015).

Research on the DSM-IV, PDD diagnoses did not support the separation of three diagnostic categories, however, which is why the DSM-5 integrated autism, Asperger's syndrome, and PDD-NOS into autism spectrum disorder (ASD; APA, 2013). The ASD diagnostic label and criteria were created to reflect research revealing that individuals with any of these diagnoses demonstrated behavioral variations of the same difficulties, rather than categorically different problems (APA, 2013). Furthermore, research supported that separation of the disorders did not result in reliable diagnoses across sites and did not predict the degree and severity of the disorder, prognosis, and treatment needs (Wiggins, Robins, Adamson,