ROUTLEDGE

HANDBOOK OF TRAUMA, TRAUMATIC LOSS, AND ADVERSITY IN CHILDREN

DEVELOPMENT, ADVERSITY'S IMPACTS, AND METHODS OF INTERVENTION

Kathleen Nader

"By examining child development and the impact of trauma exposure in detail in specific developmental epochs, the *Handbook of Trauma, Traumatic Loss, and Adversity in Children* provides both clinicians and researchers with a uniquely developmentally sensitive, resilience-based, and trauma-focused basis on which to develop and conduct psychotherapy with children who have severe self-regulatory and relational difficulties. It will be an invaluable resource in my practice and research for years to come."

Julian D. Ford, PhD, ABPP, professor of psychiatry and law, director of the Center for Trauma Recovery and Juvenile Justice

"In this handbook Dr. Nader brilliantly details the developmental impact of trauma during childhood. The structure of the book provides an easy way to learn how trauma affects child development and the potential long-term impact of trauma. The healing role of parents and teachers as well as the resilience of children are highlighted, and the often cascading adversities after trauma are discussed. Having treatment methods for each developmental period offers great hope for helping children who have experienced traumatic events."

Alison Salloum, PhD, LCSW, professor, School of Social Work, University of South Florida

"This comprehensive volume brings a welcome developmental approach to understanding trauma in children—from its far-reaching effects to individualized treatment. This is essential reading for practitioners and policy makers concerned about the effects of early adverse experiences on children."

Charles H. Zeanah, MD, Mary Peters Sellars Polchow Chair in Psychiatry, professor of psychiatry and pediatrics, and vice chair for child and adolescent psychiatry at the Tulane University Institute of Infant and Early Childhood Mental Health

"As an adoptive parent as well as a certified babysitter for foster children, I found the information Dr. Nader shares about the factors contributing to childhood trauma and approaches that may best serve these children to be insightful. The breadth of research that Dr. Nader covers over a broad range of ages and trauma conditions is truly staggering. This body of work will prove valuable for those working with children suffering from trauma."

Fiona McInally, transactional attorney

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Handbook of Trauma, Traumatic Loss, and Adversity in Children

The *Handbook of Trauma, Traumatic Loss, and Adversity in Children* is a developmentally oriented book rich with findings related to child development, the impact of trauma on development and functioning, and interventions directed at treating reactions to trauma.

Aspects of attachment and parenting and the use of interrelationships toward therapeutic ends are included in each age-related section of the book, ranging from 0 to 18+. Consolidating research from a range of disciplines including neurobiology, psychopathology, and trauma studies, chapters offer guidance on the potentially cascading effects of trauma, and outline strategies for assisting parents and teachers as well as children. Readers will also find appendices with further resources for download on the book's website.

Grounded in interdisciplinary research, the *Handbook of Trauma, Traumatic Loss, and Adversity in Children* is an important resource for mental health researchers and professionals working with children, adolescents, and families during the ongoing process of healing from traumatic exposure.

Kathleen Nader, DSW, is the former codirector of the UCLA Trauma, Violence, and Sudden Bereavement Program and an internationally recognized expert, consultant, and clinician working with childhood trauma. Among her publications are *Understanding and Assessing Trauma in Children and Adolescents* and *Assessment of Trauma in Youths*.

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Kathleen Nader

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Preface

When I was flying to a school to consult after a catastrophic event, the young man who sat in the aisle seat in our row was quickly surrounded by women (including every female flight attendant on the large plane). They hovered around him and seemed to want to touch him. He was very polite. While looking to understand, I realized that he had no tension in his face. No one else on the plane showed such an absence of tension (some of whom I learned were his teammates). When I asked him about it after lunch, he said that it was true, he didn't feel stressed or tense. He attributed it to being an athlete and to clean-living—he ate right, exercised daily, and had caring parents. Since then, I've looked for faces that showed such a lack of tension and that communicated the same being at-peace with self. Even in younger age groups (ages 3 or 4), there have not been many such tension-free and at-peace faces. Although part of people's attraction to the young man on the plane may have been his athletic status (not one of the best publicized sports; I had not heard of him before), when I've found others who have had the same lack of tension and apparent peace with self, people inevitably seem attracted to them. The quality of connections (e.g., to parents, other adults, peers/team) seems to contribute to the tension-free, peaceful demeanor or state of mind. The quality of connections and parenting are important aspects of what is discussed in this book.

Even in a country where more frequent mass shootings and other catastrophic events occur, actions can be taken that reduce the likelihood that a child will be depressed and/or anxious, become violent or disruptive, or develop other maladaptation. After some events, such as school shootings, the ways we (as a nation or community) had failed to prevent escalation in the shooter are sometimes glaring (e.g., long mental health wait lists; failure to connect; lack of preventive or other interventions). Preventive actions include improving connection (e.g., caregiver–child attachments, teacher and peer connections to a youth), enhancing resilience (e.g., coping skills, self- and other-awareness skills, self-talk), and assisting repair after adversity, loss, traumatization, or other developmental disruption. Programs are available to accomplish each of these improvements or types of repair and are described in this book.

This book discusses important developmental domains (Chapters 1, 5, 8, 11, 14); the variables that affect them (Chapter 4 and age-related chapters); the influence of trauma or significant adversity on developmental skills, mental health, health, and functioning, initially and across time (Chapters 2, 3, 7, 9, 12, 15); and treatment or preventive methods to increase protection and to assist repair and recovery (Chapters 7, 10, 13, 16). Four different age groups are discussed—ages 0–3, 3–6, 6–12, and 13–17 or older (Chapters 5–16). For each age group, one chapter examines developmental skills or tasks, a second describes trauma's possible effects on development and some of the trauma symptoms relevant to the age group, and a third provides interventions. Sensitive periods of development relevant to an age group are included as well as general information about the kinds of developmental tasks that can be interrupted by exposure to traumatic events or loss. The final chapter includes issues related to goodness-of-fit, personality—rapport versus clash—and burn-out prevention. Relevant topics are discussed as they apply to each age group (in age-related chapters), and topics important to a specific age group are also discussed. The book is peer-reviewed and extensively researched. To save space, summary references, rather than individual references, are often used, indicated by *see* (see Author et al., 2019).

Kathleen Nader

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Abbreviations

5-HTTPLR	a serotonin polymorphism (see Appendix Table A4.1—serotonin)
7r	7 repeat allele
a-f	attachment figure
AAI	adult attachment interview
ABC	Attachment and Biobehavioral Catch-Up
ABFT	Attachment-Based Family Therapy
ACC	anterior cingulate cortex
ACEs	Adverse Childhood Experiences
ACTH	adrenocorticotropic hormone
ADHD	attention deficit hyperactivity disorder
AEDP	Accelerated Experiential Dynamic Psychotherapy
AKA	also known as
AM	autobiographical memory
ANS	autonomic nervous system
APA	American Psychological Association
APD	antisocial personality disorder
ApoE	apolipoprotein E gene
AQS	Attachment Q-Set
ARC	Attachment, Self-Regulation, and Competency (treatment)
ASAD	adult separation anxiety disorder
ASD	acute stress disorder
ASPD	antisocial personality disorder
ATT	Attention Training Technique
AuSD	autistic spectrum disorder
AVP	vasopressin
AVPD	avoidant personality disorder
BAS	behavioral activation system (Gray, 1972, 1991)
BD	bipolar disorder
BDNF	brain-derived neurotrophic factor gene
BEIP	The Bucharest Early Intervention Program
BI	behavioral inhibition (see also NE)
Big 5	five well-studied personality traits (see Glossary)
BIS	behavioral inhibition system (Gray, 1972, 1991)
BMI	body mass index
BPD	borderline personality disorder
CAPSLE	Creating a Peaceful School Learning Environment
CBCL	Child Behavior Checklist (Auchenbach, updated for DSM-5)
CBT	cognitive behavior therapy

CD	conduct disorder
CDI	child-directed interaction (component of PCIT)
CDIP	Children of Divorce Intervention Program
CEN	the central executive network (a neural connectivity network)
CG	complex or complicated grief (see TG, PG)
CNS	central nervous system
COMT	catechol-O-methyltransferase (gene)
COplay	Child-Oriented Play
COS	Circle of Security (COSP: COS parent; COSI: COS intensive)
CPP	Child–Parent Psychotherapy
CPS	Child Protective Services
CPT	Cognitive Processing Therapy
cPTSD	complicated or complex PTSD or complicated trauma
CRH	corticotropin-releasing hormone
CRHR1	CRH receptor 1
CS	complex span
CSA	child/childhood sexual abuse
CSG	complicated spiritual grief
CT	cortisol
CU	callous-unemotional (traits)
CWMT	Cogmed Working Memory Training
D-amnesia	dissociative amnesia
DA	dopamine
DAT1	dopamine transporter 1 (see Table A4.1)
DBT	dialectical behavior therapy
DC 0–3R	*Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood*, revised
DD	dissociative disorder
DES	Dissociative Experiences Scale
DHEA	dehydroepiandrosterone
DHEA-S	DHEA sulfatre
DID	dissociative identity disorder
DMN	default mode network (a neural connectivity network)
DNA_m	DNA methylation (see Glossary)
DoG	delay of gratification
DPD	dependent personality disorder
DQ	developmental quotient
DRD2	dopamine receptor D2
DRD4	dopamine receptor D4
DSED	disinhibited social engagement disorder
DSM-IV	*Diagnostic and Statistical Manual of Mental Disorders*, 4th edition
DSM-5	*Diagnostic and Statistical Manual of Mental Disorders*, 5th edition
DT	developmental trauma
DTD	developmental trauma disorder
DV	domestic violence (see also IPV)
DVD	digital versatile disk or digital video disk
EA	emotional abuse
EC	effortful control
EEG	electroencephalogram (measures brain electrical activity)
EFs	executive functions

EF-CBT	emotion-focused CBT
EFTT	emotion-focused therapy for trauma
EFTT-EE	EFTT with empathic exploration
EFTT-IC	EFTT with imaginal confrontation of the perpetrator(s)
EMT	Enhanced Milieu Teaching
ER	emotion regulation
ERASE-SPS	Enhancing Resiliency among Students Experiencing Stress and Promoting Prosocial Orientation (intervention method)
ERN	error-related negativity
ERP	event-related potential
ERS	excessive reassurance seeking
F-B	false belief
FBP	The Family Bereavement Program
FC	foster care
F-F	forward-focused
FKBP5	(genotype) FK506 binding protein 5
FL	Florida
fMRI	functional magnetic resonance imaging
F-P	foster parents
FnC	functional connectivity
G-H	Grief-Help
GABA	gamma-aminobutyric acid (see Glossary)
GAD	general anxiety disorder
GC	glucocorticoid
GDD	global developmental delay
GR	glucocorticoid receptor
GTI	Grief and Trauma Intervention
GTI-C	GTI with coping skills only
GTI-CN	GTI with narrative and coping skills
HA	harm avoidance
HAB	hostile attribution bias
H-D	high-decreasing (a separation anxiety group)
H-I	high-increasing (a separation anxiety group)
HPA	hypothalamic-pituitary-adrenal (axis)
HPD	histrionic personality disorder
HTR2A	see Appendix Table A4.1—serotonin
IC	institutional care
ICAM-1	intercellular adhesion molecule-1
ICD-10	*International Classification of Diseases and Related Health Problems* (10th edition)
ICD-11	ICD, 11th edition
ICN	intrinsic (neural) connectivity networks
IGTC	Integrated Grief Therapy for Children
INSIGHTS	Insights Into Children's Temperaments (a parent, teacher, student program)
IPP	Infant–Parent Psychotherapy
IPV	inter-parental violence (AKA domestic violence)
IQ	intelligence quotient
ITCT-A	Treatment for Complex Trauma-Adolescent
IWM	internal working model
IY	Incredible Years Series®

IYTCM	IY teacher classroom management program
K	kindergarten
KC	Kindness Curriculum
KIDNET	children's Narrative Exposure Therapy
LCA	latent class analysis
LD	language difficulties or language delay
LI	language impairment
MAO-A	monoamine oxidase A
MBT-A	Mentalization-Based Treatment for Adolescents
MBT-C	Mentalization-Based Treatment for Children
MBTI®	Myers–Briggs Type Indicator
MBTI-C	MBTI-child
MDD	major depressive disorder
Met	methionine (see Val)
MI	Motivational Interviewing
MindUp™	a mindfulness-based school program
MMTT	Mindfulness and Metta Trauma Therapy
mPFC	medial prefrontal cortex
MTB	Minding the Baby®
MTFC-P	Multidimensional Treatment Foster Care for Preschoolers
N	number (number of subjects/people in the study)
N2 amplitude	see Glossary
NA	negative affectivity (see NE)
NPD	narcissistic personality disorder
NE	negative emotionality or neuroticism
NE/BR	negative emotionality/behavioral dysregulation
NET	Narrative Exposure Therapy
NF	intuitive feeling (Jungian-based personality type)
NFS	negative feedback seeking
NI	never institutionalized
NICHD	National Institute of Child Health and Human Development
NPD	narcissistic personality disorder
NR3C1	nuclear receptor subfamily 3—a glucocorticoid receptor gene
NS	novelty seeking
NSSI	non-suicidal self-injury or self-injury
NT	intuitive thinking (Jungian-based personality type)
NWC-distress	normal waking conscious posttrauma distress
NYLS	New York Longitudinal Study
OCD	obsessive-compulsive disorder
ODD	oppositional defiance disorder
OGM	over-general memory (see Glossary)
OT	oxytocin
P	persistence
P3 amplitude	see Glossary
PaCT	Psychoanalytic Child Therapy
PanD	panic disorder
PanD-AGO	panic disorder with agoraphobia
PC	parent coach
PCBD	persistent complex bereavement disorder
PCC	posterior cingulate cortex

PCIT	Parent–Child Interaction therapy
PD	personality disorder
PE	psychotic episode
PEP	pre-ejection period reactivity
PFC	prefrontal cortex
PG	prolonged grief
PIP	Parent–Infant Psychotherapy (see IPP)
PNS	parasympathetic nervous system (has sometimes been called PSNS to distinguish it from peripheral nervous system)
PO-MDD	preschool onset major depression
PPD	paranoid personality disorder
PPT	Preschool PTSD Treatment
PT	posttraumatic
PTC	posttraumatic cognitions
PTE	potentially traumatic event
PTG	posttraumatic growth
PTS	posttraumatic stress
PTSD	posttraumatic stress disorder
PTSD<6	PTSD for children age 6 and under
PTSD-DS	PTSD-dissociative subtype
PTSS	posttraumatic stress symptoms
PUFA	polyunsaturated fatty acids (e.g., omega-3)
PV	poly-victimization
PVN	hypothalamic paraventricular nucleus
R&T	rough-and-tumble play
rACC	rostral anterior cingulate cortex
RAD	reactive attachment disorder
RD	reward dependence
REM	rapid eye movement (a sleep state)
RF	reflective functioning (see also metacognitive monitoring, mentalizing in Glossary and in Table 1.2)
RS	rejection sensitivity
RSA	respiratory sinus arrhythmia
rvlPFC	see vlPFC
sAA	salivary ∝-amylase
SAD	separation anxiety disorder
SD	subclinical depression
SE®	Somatic Experiencing® (an intervention)
self-reg	self-regulation
SES	socioeconomic status
Short-Term PaCT	Short-Term Psychoanalytic Child Therapy
SI	social inhibition
SJ	sensing judging (Jungian-based type)
SN	salience network (a neural connectivity network)
SNAP-25	synaptosomal nerve-associated protein 25
SNS	sympathetic nervous system
SoA	social anxiety
SoAD	social anxiety disorder
SP	sensing perceiving (Jungian-based type)
SPARCS	Adolescents Responding to Chronic Stress (a treatment)

SRP	School Resilience Program
SSP	Strange Situation Procedure (young attachment assessment)
ST	secondary traumatization
SU	substance use or abuse
SW	social worker
SYG	Settle Your Glitter (an intervention)
SZPD	schizoid personality disorder
T1	time 1
T2	time 2 …
TARGET	Trauma Affect Regulation (a treatment)
TF or T-F	trauma-focused
TF-CBT	trauma-focused CBT
TF-CBT-YC	trauma-focused CBT (British version for young children)
TG	traumatic grief
TG-CBT	traumatic grief-CBT
TGCT-A	Trauma and Grief Component Therapy for Adolescents
TMS	transcranial magnetic stimulation
TOM	theory of mind
TPH	tryptophan
TRASC	trauma-related altered states of consciousness
TSRD	trauma- and stressor-related disorders (see DSM-5)
UK	United Kingdom
US or U.S. or USA	United States
Val	valine (a BDNF variant includes Val66Met; a COMT variant includes Val158Met; see Appendix Table A4.1—BDNF, COMT)
vlPFC	ventrolateral PFC (rvlPFC: right vlPFC)
vmPFC	ventromedial PFC
vs	versus
VS	ventral striatum
WHO	World Health Organization
WM	working memory
WOJ	The Worry Outcome Journal
YPT	PPT adapted for older children

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Part I
Introduction

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1

Child Developmental Domains That May Be Influenced by Trauma or Other Adversity

This is an era when youth are aware of the many dangers in the world (e.g., via news, internet, friends, adult warning, or teaching protection). Everyday stressors—e.g., socioeconomic issues, family conflict, stressful community conditions, displacement, expectations of school violence, and media exposures to a variety of threats (Box 1.1)—may directly influence or add to adversity's impact or to a child's vulnerability to stressful or frightening events. Nonverbal young children may be affected by conflict levels and by news reports (Box 1.1). If youth hear or see news reports, in a single week they may learn, for example, that priests may sexually abuse children, adults may teach children to carry out school shootings, and children die when left in hot cars or buses. For weeks, the 2018 Parkland, Florida high school shootings were in the news. After a subsequent threat to his school, a youth in Alabama wrote a will, "Just in case" [he was killed]. A mother in Texas asked her adolescent daughter if she knew what to do if there was a school shooting. She answered, "There's nothing you can do, Mom." A Florida youth from the school where the shooting occurred cried in distress after learning that there was another shooting, even though no one was killed. She pleaded, "We're supposed to be healing …" For traumatized youth, each similar or new event may increase distress. When 10 were killed in a school shooting in a Santa Fe, Texas school, later in 2018, a student said she wasn't surprised. She said, "We expect things like this to happen."

As will be discussed in the chapters that follow, stress and trauma can have deleterious effects on children, including effects on important developmental domains such as brain and skill development. Although this chapter periodically mentions some of the effects of trauma, its primary focus is the important developmental domains that may be affected by adversity. Chapter 2 focuses on trauma's impact on these domains. Chapter 3 looks at cascading and long-term effects of traumas. Chapter 4 examines variables that influence outcomes. Later chapters examine age-related developmental issues, trauma/adversity's potential impact on them, and proven treatment methods. This chapter provides a brief overview of the developmental skills/domains that may be affected by stress or trauma.

Child Development and Stress

Normal stress—tolerable, short-lived adverse experiences—may cause minor physiological changes—e.g., increased heart rate and hormone levels (e.g., cortisol). Such stress can be important to the developmental process and development of coping and resilience (Gunnar, Doom, & Esposito, 2015; Middlebrooks & Audage, 2008). Intense adverse experiences, in contrast, may

Box 1.1 Hurricane Harvey: Response to Media Coverage

Effects on Central Texas (away from the Gulf) *with* ***Televised Hurricane Harvey*** *and rain and wind damages*

Prediction: a week of heavy rain and high winds; possible flooding and wind damage.

TV: warning videos showing people trying to drive through what looked like a few inches of water and finding themselves with a flooding car; constant coverage of the hurricane.

History: a 12-year drought; numerous floods, severe storms, and tornadoes; devastating floods with loss of life after trying to drive through "a little water" or not heeding evacuation orders.

2015: a storm that resulted in flooding had washed away homes (e.g., 72 in San Marcos) or damaged homes (e.g., 1200–1300 in Hays County). In a badly flooded region, a couple with two young children inside their home when it washed away in the flood waters. The father was rescued and hospitalized. For weeks, people watched the news, first to see if the wife and children would be found, then to see if their bodies would be found. Houses had flooded before in the flood zone, but this was devastating. Trees were broken in multiple pieces; homes were ripped off foundations and washed away. People were washed away. Especially because children and families were involved, many people had felt the loss and now watched with worry as Hurricane Harvey unfolded.

Janie

Three-year-old Janie was left to play with toys while the family watched the hurricane on TV. When she started crying, they assumed it was play or sibling related, comforted her a bit, and interested her in coloring. For several nights after the hurricane, Janie would run down the hall to her parents' bedroom, screaming. On TV they talked of the eye of the hurricane, among other things. One night when she screamed and her mother went to check on her, she told her mother, "The eye was chasing me! The eye is going to get me!" In her play, she sent toys hurtling across the room making whooshing sounds. She chased her friends, saying she was the eye coming for them.

Sources: ABC news, CBS news, CNN, Foxnews.com, MSN.com, NBC News, *The Statesman* (Austin newspaper), friends and family; Texas Department of Public Safety.

Note:
Case examples are disguised, may be combined cases, and have had details changed to protect individuals.

produce traumatic/toxic stress and lead to permanent changes in brain and other aspects of development (Middlebrooks & Audage, 2008; Lanius et al., 2015; see Nader & Fletcher, 2014)—e.g., high levels of stress hormones (e.g., cortisol) can suppress the immune response, resulting in vulnerability to a variety of chronic health problems. Children's cortisol dysregulation can also affect their psychological development and mental health (over time; e.g., Koss & Gunnar, 2018; Suor et al., 2015). In addition to the effects of traumatic stressors, other stressors—especially high-level chronic stressors without sufficient protective factors, including risk in the parenting system (e.g., divorce, conflict, harsh parenting, parental distress; Box 1.2), related to resources (e.g., poverty), in

Box 1.2 Lilly and Jonah

Lilly was five and Jonah was three when Hurricane Harvey hit Houston. Lilly and Jonah stayed in a shelter with Granddad when Grammy and Mommy went to see the house. Grammy Bonnie's house still had six inches or more of standing water when they were allowed to return to check the damage. Particle board absorbs water, so some of the furniture Grammy had for when Lilly and Jonah stayed there was ruined. Grammy hoped the water would recede before any more damage was done. Next, they went to Mommy's house (Daddy was at work). The house had been completely submerged under water. The roof had collapsed on top of everything, destroying their home and belongings, including the children's toys, furniture, and clothes. Mommy couldn't stop crying. She couldn't think clearly enough to function (e.g., drive, take care of her children, work, cook). Grammy drove back to the shelter, and Mommy just sat crying. When the children came over, Mommy told them the house was destroyed. Young children often reflect their parents' emotions. Lilly and Jonah started crying, too. Knowing that a mother's lack of sensitive care for her children and ongoing upset could upset the children, possibly result in their symptoms, and disrupt the children's ongoing development (Chapters 3–7), Grammy tried to reassure the children. She told them it would all be okay. She told them that Mommy was really upset right now, because it was worse than she expected, but she would be better in a couple of days. Granddad came over and held and comforted their daughter (Mommy) like she was a small child. He told the children they would all stay at the shelter for now and would return to Grammy and Granddad's house when the water went down. While Granddad comforted their daughter, Grammy Bonnie tried to make the shelter experience more of an adventure for the children as well as to teach them kindness to others and to recognize when someone wanted to be left alone. They saw other families where the Mommy was upset and not taking good care of their children. Sometimes the children were screaming and throwing things. Sometimes, it was okay for Lilly to give them a hug. Then Grammy traded places with Granddad, and she comforted her daughter, while Granddad took the children on adventures. They spent another week in the shelter. Mommy improved steadily with her parents' and husband's help.

the attachment system (insecure or disorganized attachments), and in the community (e.g., low resources, ongoing threat)—have also related to negative outcomes for children. In addition to their disruption of normal development, reactions to stressors include a wide variety of disorders and difficulties. Among reactions are posttraumatic (PT) or other stress-related disorders (e.g., PTSD; persistent complex bereavement disorder; reactive attachment disorder [RAD], Chap 5), chronic distress, exacerbation or triggering of genetic vulnerabilities (e.g., anxiety, depression), increased reactivity to stress, changes in self and life (e.g., traits, inter-relating, life satisfaction, confidence, sense of safety), and many potentially long-term consequences (e.g., epigenetic changes [see Glossary], health; Table 3.1).

Normal Variation

An hour in a day care or classroom can make clear how important adult care and value are to children, that things may be different than they initially seem, and how children behave differently in different contexts (e.g., with different adults or children; Boxes 1.3, 10.1, 10.2). A youth's individuality is key to important aspects of intervention (Chapter 4). As will be seen, although most children respond to gentle, attentive care, the route to rapport can vary significantly for different children or child groups (Boxes 10.1, 13.2). As well, when assessing, diagnosing, and treating youth behavior and reactions, it is essential to recognize developmentally normal characteristics. Although

symptoms like impulsivity, dissociation, or reticence or withdrawal can be normal following traumas, they must be distinguished from behaviors common at specific phases of development or for specific temperaments (Nader, 2008). For example, when evaluating sexual behaviors, thoughts or actions common to an adolescent male (e.g., thinking about sex, difficulty stopping sex thoughts, sexual feelings in the body) may be a sign of disturbance (e.g., sexual molestation; exposure to adult TV) in an eight-year-old or younger male (Friedrich, Jaworski, Huxsahl, & Bengtson 1997; see Box 10.2). Some behaviors/styles (e.g., fearful inhibition) occur normally at certain developmental phases and are commonplace for certain personality styles (e.g., slow-to-warm—see Glossary and Nader, 2008). By around eight months, hesitance in approaching novel or intense objects is normal for infants (Putnam, Ellis, & Rothbart, 2001). Additionally, particular reactions (e.g., fear) manifest differently at different ages—e.g., infants' crying, clinging, or increased activity; adolescents' internalizing (Putnam et al., 2001; Rothbart, Chew, & Gartstein, 2001b). When assessing dissociation, it is important to recognize that young children often exhibit forgetfulness, attention shifts, and a variable sense of identity; daydreaming may be common for youth, and feeling unreal and detached from experience common for adolescents (Putnam, 1997; Friedrich et al., 1997).

Box 1.3 University Day Care: 3-year-olds

Children behave at least somewhat differently in the presence of or in response to different individuals and in different contexts. For that reason, for a full understanding of a child—his/her skills, participation levels, temperament, and other qualities—it is important to observe a child in different contexts and among different people. In a university day care, one or both parents rotated in to assist for an hour or two once in a 3- or four-week rotation. When an observer walked into the three-year-old's room at the day care center in order to observe "normal" children's behaviors before studying disordered children, she was impressed at the different personalities so evident in each of the children. Very rapidly the children began to treat her like one of the teachers. For the first two weeks, one boy seemed to be playing *follow-the-leader* even though no one was playing the game. He picked the person who was doing the most notable behavior (e.g., running, jumping, spinning, block building) and followed along behind, mimicking the behavior, regardless of gender, status, or IQ level in the one he followed. Although otherwise verbal and assertive, he later described himself as sometimes shy (a teacher agreed with him), and may have felt unsure about how to join in socially. Ali was a bright, pretty, outgoing three-year-old girl, who interacted well with other children. Ali smiled at each adult who entered the room and waited. She relaxed if the adult delighted in seeing her and seemed slightly distressed if they gave a lukewarm hello. However, when her mother was there, she pouted most of the hour, e.g., when any other child sat on her mother's lap or her mother assisted another child—e.g., she said something like, "No, you're only supposed to let me sit on your lap." Joshua was a bright, active little boy whose activity escalated whenever other boys joined in with his play—that is, they all quickly became a bit rowdy. He was quick to figure out tasks for activity time and to answer questions during learning time. However, when his parents were co-teachers, he seemed to freeze or regress when his very bright, take-charge mother led activities. Unlike his usual behavior, he would scribble instead of color and seemed less able to do things or provide answers to lesson questions.

Note:
Case examples are disguised, may be combined cases, and have had details changed to protect individuals.

Developmental Skills/Domains: Part I

Many developmental domains evolve in skill and complexity over time and gain prominence during certain age periods (Chapters 5, 8, 11, 14). For children, a number of developing skills influence the ability to relate to others, the beliefs a youth holds about her/himself, and the nature and levels of her/his personal achievement and other functioning (Carrion, Weems, Ray, & Reiss, 2002; see Nader, 2008). Skills are used in combination and sometimes have interrelated components. For example, self-awareness, other-awareness, memory (Table 1.1), and executive functions

Table 1.1 Types of Memory

GENERAL

Encoding

- *Explicit memory* (Declarative or Conscious memory)—requires conscious focused attention for encoding
  - may suddenly emerge in consciousness or be intentional
  - evident between ages 6 and 12 months, but far from fully developed until subsequent development of hippocampus sub-regions and connections to and from associated neocortical areas
  - a conscious recollection (e.g., elephant at the zoo)
  - recollection of subjective awareness of information encountered in the past
    - auto-noetic or self-knowing—e.g., ability to think back and re-experience
    - noetic or knowing—e.g., a historical or personal fact
- *Implicit memory* (Non-declarative or Unconscious Memory)—does not require conscious attention for encoding
  - being able to recollect information without remembering the experience in which it was learned
  - present from birth
  - things learned from practice or exposure (e.g., cultural standards)
  - behavioral or procedural memories (e.g., riding a bike; skill learning)
  - priming (facilitated processing of a stimulus because of prior experience with it)
  - emotional memories (e.g., fear associated with injury or threatening experiences)
  - indirect memory (e.g., studying a list of words including elephant, then completing root ele…)

Direction

- *Prospective memory*—remembering to perform a planned action or intention (e.g., take med; Skype Sully)
- *Retrospective memory*—memory for the past or for the effects of past experience on current behavior

References: Bjorklund & Sellers, 2014; Damon & Lerner, 2008; De Bellis & Zisk, 2014; Einstein, 2008; Nelson, Thomas & de Haan, 2008; Reynolds & Richards, 2008; Roediger et al., 2008; Sapolsky, 1998; Siegel, 1996

SHORT-TERM MEMORY

- *Short-term memory*—information one is currently aware of or thinking about; recently stored memories; duration and capacity are much lower than long-term memory
  - brief maintenance of a few memory items (number of items increases with age and cognitive abilities; held up to 20–30 seconds), before long-term storage
  - can also have short-term influence of unconscious/implicit memories (e.g., taking the accent of a person you're speaking to)
- *Short-term Sensory Memories*—implicit sensory inputs/impressions held briefly in short-term memory before storage in long-term, implicit or explicit memory

References: Cowen, 2008; Fuhrmann et al., 2015

continued

Table 1.1 Continued

LONG-TERM MEMORY

- *Long-term memory*—vast store of knowledge and record of past events
- *Long-term Sensory Memory*—encoded sensory impressions (e.g., visuo-spacial, olfactory, tactile impressions/experiences)
  - implicit, sensory impressions in infants or toddlers may later express in play, repetitious activities, or verbalizations without conscious awareness of their link to experience
  - includes non-verbal memories of possibly fragmented, sensory and emotional elements of a traumatic experience

References: e.g., Nelson et al., 2008; Roediger et al., 2008; Talwar, 2007

- *Episodic Memory*—self-referent; placing self in a set of circumstances at a particular time (Bjorklund and Seller, 2014)

- *Autobiographical memory (AM)*—memories about the self (e.g., Furhmann et al., 2015)

- *Autobiographical Memory specificity*—AM can be represented at varying degrees of specificity (Williams and Broadbent, 1986)
  - semantic memories on periods of life (e.g., name of favorite football team) (see Eisma et al., 2015)
  - events that extended over a period of time (e.g., learning or teaching a team)
  - memories in a category of similar events (e.g., watching a season of football games)
  - occurrences in a specific time and place (e.g., at the stadium, in Los Angeles, Sunday)
  - in contrast to over-general memories (general and without specifics)

- *Semantic Memory*—abstract factual knowledge (e.g., remembering 1st U.S. president)

- *Procedural memories*—how to do something (e.g., make recipe, play piano [Bjorklund and Sellers, 2014])

WORKING MEMORY

- *Working Memory*—temporarily stored and manipulated information (e.g., Luciana et al., 2005)
  - improves with age—lower or less efficient use of dorsolateral PFC is involved in differences for middle childhood (Nelson et al., 2008); may be derailed by mood state (Luciana, 2016)
  - long-term memory contributes by organizing and grouping information in working memory into categories or smaller units (e.g., remembering IRSCIAFBI more easily because it represents government agencies, Cowen, 2008)
  - updating—i.e., constant monitoring and rapid addition/deletion of working memory contents (Bunge & Crone, 2009; Rose et al., 2012; e.g., not adding the same ingredient twice when baking, solving a math problem, Cowen, 2008)
  - cross-domain associations (e.g., retention of links between names and faces, Cowen, 2008)

(EFs) all contribute to interpersonal relating. Self-awareness is important to perspective-taking. The ability to take the perspective of another also is important to social skills, which include the ability to influence others, express and understand humor, and display empathy (Semrud-Clikeman & Glass, 2010; Table 1.2). On one end of a continuum, a well-liked child who can appropriately interpret and respond to others' behaviors and intentions is likely to laugh at their jokes and make jokes of his/her own. In contrast, at the other end of the continuum, a child with an autistic spectrum disorder (AuSD) who has low perspective-taking skills (Southall & Campbell, 2015) may be unable to grasp humor (Wu et al., 2014). The ability to communicate feelings to caregivers, regulate emotions, and actively explore the environment provides the groundwork for later social-emotional competence, readiness to enter school, and effective academic and social performance (Bowlby, 1969/1982).

Table 1.2 Definitions for Self- and Other-Relatedness

Empathy
- perspective-taking combined with emotional reaction usually engendering compassion or sympathy
- the ability to understand and share in the feelings of another person
- a combination of perspective-taking and empathic concern
- divided into *affective*, *cognitive*, and *somatic empathy*—e.g., theory of mind may be considered a cognitive aspect of empathy
- a part of temperamental affiliativeness

Affective empathy
- sharing of emotional states
- ability to feel emotions congruent with the other's emotions
- ability to infer the emotional states of others
- identifying emotions felt in response to a story that might elicit empathy

Cognitive empathy
- perspective-taking
- ability to understand another's mental and emotional states
- recognizing the "how" and "why" of another's affective states
- ability to infer the thoughts of others
- ability to understand why s/he responded to a story with the emotions felt

Somatic empathy
- reacting within the body empathetically—e.g., heart beating fast when a movie character or person is in danger

Behavioral empathy
- actions taken to help someone
- what s/he thinks s/he would do to help a person in a story that might elicit empathy

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Mentalizing—seeing the self from the outside, and seeing others from the inside
- self-reflective functioning + perspective-taking
- the ability to think about and interpret self and others in terms of mental states
- ability to understand others' behavior in terms of mental states (e.g., beliefs, desires, feelings, and memories)
- ability to reflect on one's own mental states, and the ability to understand that one's own states of mind may influence others' behavior
- ability to engage with an infant mentally—i.e., to imagine the infant's psychological experience and interpret and respond to her/his behavior in terms of what it communicates about the infant's underlying subjective experience or mental states

Hyper-mentalizing
- presumptions are made about the mental states of others that go beyond available data
- hypersensitivity to the mental states of both self and other

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Metacognitive monitoring
- ability to step back and consider one's own cognitive processes as objects of thought or reflection
- thoughts about thoughts, emotions, and behaviors
- suggests an ability to understand one's own and others' behaviors in terms of mental states or psychological experiences

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Mind-Mindedness
- parents use of more mental state words toward and about the child
- is typically inferred through analysis of a mother's mind-related comments, which may be either attuned and accurately reflecting the infant's mental states or non-attuned and misunderstanding the infant's mental states

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continued

Table 1.2 Continued

Perspective-taking
- the ability to understand the perceptual, cognitive, emotional, or motivational reactions of other people, even when reactions are different from one's own
- recognizing one's own perspective in relationship to that of others—as consistent and distinct from others
- may be able to view a situation from a self-, other-, or 3rd-party vantage point

Reflective functioning or self-reflective functioning—like metacognitive monitoring or theory of mind
- suggests an ability to perceive and understand one's own and others' behaviors in terms of mental states or psychological experiences
- competence to envision self and others' thoughts, feelings, desires, and intentions
- ability to interpret the meaning of others' behavior by considering underlying mental states and intentions
- a continuum from denial of mental states, to a basic capacity to recognize simple thoughts and feelings, to emergence of true reflective awareness, i.e., the ability to understand behavior in relationship to mental states and to understand both the nature and dynamic interplay of such states

Theory of Mind
- the ability to attribute mental states—e.g., beliefs, intentions, desires, pretending, knowledge—to oneself and others
- ability to understand that others have beliefs, desires, and intentions different from one's own
- linked to empathy

References: Bensalah et al., 2015; Boltz et al., 2015; Coplan et al., 2005; Ensink et al., 2017, 2018; Evans & Rothbart, 2007; Fonagy and colleagues: e.g., Fonagy et al., 1998, Fonagy & Bateman, 2016; Fosha, 2003; Hoffman, 2015; Longobardi, Spataro, & Colonnesi, 2018; Main, 1995; Moran et al., 2018; Muller & Midgely, 2015; Premack & Woodruff, 1978; Rochat, 2003; Steele et al., 2015; Waller et al., 2015; Chapters 4, 6, 8, 10.

As noted, child development is influenced by many factors—e.g., environments; child factors; relationships; exposures; audio and visual media (Box 1.1; Chap 4, 8). Even exposure to stress before conception or in utero (e.g., to family conflict) as well as exposure to early or ongoing stress, traumatic stress, and/or significant loss may impact the lives and development of children and adolescents. The impact of such stressors may have cascading and long-term effects (Chapter 3). A sampling of multiple risk and protective factors that may influence outcomes of exposure to stressors is presented below and in detail in Chapter 4 and the Appendix (Tables A1.1–A1.4):

- environmental factors—e.g., caregiving, stressors, resources, opportunities (e.g., to learn, explore)
- child factors—e.g., genetics, attributes, reaction style, coping capacity, history, resilience
- exposures factors—e.g., number and severity of exposures, nature of the event, personal meaning
- event aftermath—support systems, safety, media exposures, additional stressors

To follow are some important skills—executive functions, social skills, language, play, and humor. Although some skills (e.g., self-regulation) are a part of EFs, self-skills are addressed in the next section of this Chapter. Trauma and adversity's impact on skills is discussed in Chapter 2. Age-specific information about skills and general information about outcome-influencing variables are provided in other chapters (e.g., attachment, genetics, personality, Chapter 4). Early and ongoing caregiver–child attachments are the basis for a number of developing skills—e.g., provide a basis for coping and styles of inter-relating (Bauminger et al., 2008; Chapter 4). Caregivers are important to development and to posttrauma and developmental recovery.

Executive Functions (EFs)

EFs include higher-order cognitive abilities that are necessary for goal-directed behavior—e.g., memory, mental flexibility, inhibition, strategy development, abstraction, cognitive switching, and flexible thinking (Cassidy et al., 2017; Fatima, Sheikh, & Ardila, 2015; Jurado & Rosselli, 2007; Monette, Bigras, & Lafrenière, 2015; Glossary). EFs also include purposeful, goal-directed activity, such as self-regulation, planning, and problem-solving (Rose, Feldman, & Jankowski, 2012a). EFs are apparent in infancy and generally improve with age. Large-scale brain networks important to cognitive functions dynamically integrate with and segregate from one another to enable behavior (Chai et al., 2017). These networks, predominantly linking frontoparietal regions of the executive system, increase in both expression and flexibility from childhood to young adulthood (N = 200, ages 8–11 and 19–22; Chai et al., 2017; Glossary—e.g., default mode network). Nevertheless, aspects of EFs have significant continuities over time (Rose et al., 2012a). Although children vary in their processing speeds, attention, and memory, for a significant number of infants, their cognitive abilities are consistent through adulthood. Often studied EF abilities are *working memory*, *inhibition*, *planning*, and *cognitive shifting* as well as *self-regulation* and *generativity* (Glossary; Bunge & Crone, 2009; Del Giudice, 2014; Rose et al., 2012a).

Age-related increases in attention efficiency, evidenced by the ability to filter out irrelevant information, are associated with age-related improvements in working memory (Cowan, 2011). From middle childhood to late adolescence, brain regions involved in EFs increase in expression and in dynamic, flexible switching behavior. EFs used in cognitive flexibility (Glossary) improve and mature at different rates—e.g., switching in context of distracting information, ages 2–3; switching with conflicting information, ages 3–3.5 (Blakey, Visser, & Carroll, 2016); inhibition at ages 10–12; working memory in adolescence (Simlesa & Cepanec, 2015). Children with higher EFs are significantly more socially adept, have better academic skills, perform better in school, and appear to be at lower risk for behavioral and emotional problems than those with lower EF. Low EFs have been related to a number of problems. For example, obese youth have shown broad impairments on EFs, including on tasks primarily utilizing inhibition, cognitive flexibility, working memory, decision-making, verbal fluency, and planning, while overweight youth have had only inhibition and working memory problems (meta-analysis, Yang, Shields, Guo, & Liu, 2018).

Inhibition

Although inhibition commonly refers to an ability to suppress a dominant, automatic or pre-potent response, it also includes other forms of control—e.g., interference control, directed forgetting, emotional control, and motor control (Best, Miller, & Jones, 2009; Glossary). Inhibition may include attentional, behavioral, thought, and/or emotional control to override a strong internal predisposition or an external lure (Roskam, Stievenart, Meunier, & Noel, 2014). Inhibition improves significantly in preschool years (especially ages 5–8; e.g., better able to follow odd instructions such as to say, "Night," when seeing a sun picture), and continues to improve through middle childhood (e.g., motor tasks, looking tasks) and up to age 21 (e.g., cognitive inhibition; refinements in speed and accuracy; Best et al., 2009). In later childhood and adolescence (ages 7–17), improvements are reflected in brain changes (e.g., EEG: decreased frontal N2 amplitudes showing increased neural efficiency—e.g., after prefrontal cortex [PFC] pruning [see Glossary]; Best et al., 2009; Sanger & Dorjee, 2016). Development of inhibition throughout preschool years has been related to later social and academic development (Roskam et al., 2014). Controlling for age-related improvements and other relevant variables, for both parents (more for mothers), positive parenting style, and parenting behaviors that included higher monitoring and include lower levels of discipline, inconsistency, and negative controlling were linked to better development of inhibition capacities in children (ages 2–8, across two years; Roskam et al., 2014). Inconsistent discipline

(e.g., threats of discipline without follow-through) and/or frequent punishment have had detrimental effects over time. Parenting improvements have been linked to improvements in children's inhibition. Inhibition has been improved by a number of interventions (Chapter 16; e.g., mindfulness for adolescents; Sanger & Dorjee, 2016).

Shifting

Shifting—consciously directing attention from one focus to another—includes the ability to switch between mental states or sets, operations, strategies, or tasks (Bunge & Crone, 2009; Glossary). Shifting includes activities such as the ability to redirect attention in or back to meditation or during complex tasks. Children ages 3–4 can generally *shift* reliably between two response sets, when rules are clear; improvements occur from ages 5–6 (Best et al., 2009). Shifting ability improves with age, typically until early adolescence, when, e.g., youth can shift between more complex task sets, with increases in number and rule complexity (Best et al., 2009), and show greater speed than younger youth (Bunge & Crone, 2009). Mature task shifting is reflected in brain development (e.g., youth: increased inferior frontal and parietal regions: adults: superior temporal regions).

Shifting is a part of cognitive flexibility (Glossary). In fact, cognitive flexibility has sometimes been called cognitive switching (Babb, Levine, & Arseneault, 2010). It enlists inhibition and working memory (Dajani & Uddin, 2015). Cognitive flexibility is the readiness/efficiency with which one can selectively switch between mental processes and adapt to the environment in order to generate appropriate behavioral responses (Dajani & Uddin, 2015; Darby, Castro, Wasserman, & Sloutsky, 2018). Cognitive flexibility can be critical to survival—e.g., quickly and efficiently changing from the task engaged to respond to danger. It also includes the ability to flexibly shift between multiple incompatible perspectives or descriptions of an object or an event (Farrant, Fletcher, & Maybery, 2014). In sorting tasks, evidence has shown that three-year-olds have substantial difficulty shifting to a second dimension (see Darby et al., 2018). They tend to perseverate by continuing to sort by the prior dimension. When pigeons, children, and adults were assessed for their cognitive flexibility related to the same stimuli in different circumstances—e.g., sorting cards by different dimensions (color, shape, number)—all three demonstrated memory for learned information (included 70 preschoolers; Darby et al., 2018). Although pigeons showed some adjustment, they also showed greater perseveration than humans (reflecting difficulty inhibiting the now irrelevant dimension and shift to another dimension). Children and adults showed some perseveration in the first but not the subsequent shift. Older children usually have higher cognitive flexibility and coping flexibility skills than younger children (Babb et al., 2010). Low flexibility has been found for disorders/problems such as ADHD, CD, incarceration, eating disorders, obesity, and autism (e.g., Olvera, Semrud-Clikeman, Pliszka, & O'Donnell, 2005). High cognitive flexibility has been linked to better reading ability, better academic performance, higher resilience in response to adverse life events, higher creativity, school readiness, job performance, social-emotional well-being, and better quality of life in old age (Dajani & Uddin, 2015; Suchodoletz, Slot, & Shroff, 2017).

Planning

Planning is a complex ability. It requires an ability to formulate actions in advance (e.g., goals; multiple steps to take), to approach a task with organization, strategy, and efficiency (e.g., evaluate actions and possibly change course; Best et al., 2009), and to evaluate and select a sequence of actions to achieve a desired goal (Kipping et al., 2018). Planning may include internal rehearsal and temporal sequencing (Kipping et al., 2018). Other EFs are used in planning (e.g., attention, WM, shifting, inhibition; Best et al., 2009). Abilities are related to complexity of a task and age (Best et al., 2009).

Planning ability during childhood appears to be partially achieved through specific brain networks—i.e., engagement of cerebello-cortical functional connectivity but not cortico-cortical association networks, which are less connected and more fragmented in childhood (age six; Kipping et al., 2018; Table A4.2—PFC, Cerebral Cortex). In adolescence, performance may be influenced by neural changes or injury (e.g., PFC pruning or damage). Early life maltreatment has been related to reduced lateral cerebellum volume, as well as poor performance in planning and memory in early adolescence (see Kipping et al., 2018). Adults with damage to the lateral regions of the cerebellum also have shown poor performance in planning skills. Parenting has influenced planning skills (encouraging planning; Lombardi et al. 2017; Chapter 5). Good planning skills in childhood have predicted later academic achievement and social maturity (Kipping et al., 2018; Lombardi et al., 2017). Children use skills differently at different ages. For example, in a cooperative task (child dyads), better planning skills related to more competitive behaviors for younger children (ages 5–8), whereas better planning and verbal abilities related to fewer competitive behaviors for older youth (ages 9–12; Huyder, Nilsen, & Bacso, 2017). Better theory of mind skills also related to lower levels of competitive behaviors in younger children. Partners' cooperative and competitive behaviors correlated, suggesting an influence on each other.

Attention

Attention is essential to safety, learning, interacting, doing, and accomplishing. For example, whereas attention to a popping sound may be automatic, volitional attention to whether the sound is a car backfiring or gunfire is essential to knowing whether or not to self-protect. Across life, attention-focusing activities assist the success of other activities such as learning—e.g., attention-drawing materials in academics (Karagözoğlu, 2017)—and exercise—e.g., focusing on pushing the floor away instead of tightening a region of the body while doing the exercise (Schoenfeld & Contreras, 2016). Attention can be thought of in terms of at least three functionally, neuroanatomically distinct networks—alerting, orienting, and executive attention (Federico, Marotta, Martella, & Casagrande, 2017; Posner, Rothbart, & Voelker, 2016; Glossary; Table A4.1). A small sample of children demonstrated that attentional networks are still developing from ages six to 10 years and underscored the importance of face information in modulating efficiency of executive control (ages 6–10; N = 66; Federico et al., 2017). Looking at faces is important for learning an array of social signals and visual communication cues. For example, gaze direction is an important social cue. We tend to follow the direction of others' gaze. Looking away from faces at key points can be crucial for reducing cognitive load in order to complete tasks (Federico et al., 2017).

Although attention improves with age until adolescence, it varies for different functions and is not necessarily linear. For example, although some aspects of visuospatial attention—ability to attend to and to process stimuli in one's surrounding space—improve until age 13 (e.g., related to movement planning and motor control), others remain stable with increasing age (e.g., spatial reference, N = 160, ages 4.87–19.1; Ickx, Bleyenheuft, & Hatem, 2018). The former may depend on self-body representation, which is developing through age 10. An ability for longer sustained attention to focal events supports linguistic development (low distractibility; Salley, Panneton, & Colombo, 2013; Chapter 5). For determining categorization, adults have used selective attention (Deng & Sloutsky, 2016). In an experimental setting, both 7-year-olds and adults relied on cued features for categorization and remembered cued features better than non-cued features (cued to attend; Deng & Sloutsky, 2016). Although attentional cueing assisted categorization, 4-year-olds showed equally good memory for both cued and non-cued features and remembered non-cued features better than adults.

It is impossible to attend to all incoming stimuli at the same time, therefore we must select (Wetzel, 2014). In an environment providing an influx of numerous stimuli to multiple senses, selective attention is essential to picking out information important to goals, needs, and interests,

while ignoring irrelevant information—e.g., separating human speech from other sounds, regardless of accent and intonation; separating aspects of a visual array into coherent objects (Bahrick & Lickliter, 2012). *Selective attention* can be either involuntary or voluntary—e.g., something draws full focus such as inter-sensory redundancy (Glossary; Reynolds, Bahrick, Lickliter, & Guy, 2014) versus goal-driven attention (Deng & Sloutsky, 2016). Selective attention assists processing of goal-relevant events/stimuli and inhibits processing of goal-irrelevant events/stimuli (Wetzel, 2014). Attentional control develops until the second decade of life, closely related to brain development (especially PFC). Attentional control is also influenced by sleep, experience, bias, environmental distractors, preterm birth, emotions, and more. For example, using a go/no-go task requiring attention to neutral, happy, and fearful faces (ages 6–25), there was a linear increase in response-inhibition performance with increasing age for both task-relevant and irrelevant affective emotions (Schel & Crone, 2013). Particularly for young children, a task in which the emotions were relevant affected performance on response-inhibition more strongly than a task in which the emotions were irrelevant. Happy emotions were associated with better performance; fearful faces with reduced performance. Prematurely born children have shown poorer attentional performance in sustained and focused attention, distractibility, and lower processing speed in divided attention and flexibility tasks (assessed ages 5–6; Giordano et al., 2017). Preterm children also showed decreased volitional attention compared to automatic attention (no problems in alertness or inhibition).

Diagnosing an attention deficiency accurately may influence the success of treatment. Berger et al. suggest that attention abnormalities—e.g., decreased attention span, distractibility, hyperactivity, and impulsivity—should be viewed in terms of underlying developmental processes and not as components of discrete non-overlapping disorders (Berger, Remington, Leitner, & Leviton, 2015). They suggest focusing on, e.g., brain delay in otherwise healthy children compared to their age group; effects of age and task load on attentional success; nutritional issues (e.g., effects of alpha lipoic acid on ADHD); relationship between environmental distractors and performance; and differential diagnosis (e.g., ADHD vs sensory modulation disorder).

Memory

What is unique to human-related cognition is self-conscious and intentional, symbolic representation (Bjorklund & Sellers, 2014)—particularly the ability to form memory representations of objects, people, and events in the past and to generate imaginary and possible events in the future (Sellers & Bjorklund, 2014). More than one kind of memory has been conceptualized (Table 1.1) and can be affected by traumatic exposures. Memory is essential to all aspects of functioning—e.g., academic, other productive, and interpersonal functioning (Howe, 1997). Across middle childhood and adolescence, improvements in working memory and cognitive control (Glossary) correspond to increased recruitment of task-related brain regions (Brown et al., 2005; frontal, parietal, and striatal, Bunge & Crone, 2009; Casey, Jones, & Somerville, 2011; shift from diffuse to focal activation, Durston et al., 2006; Rubia, 2013). Normally, memory can be affected by age, stress, sleep, biological factors, parental support, and the nature of a stressful experience.

Working Memory (WM). WM is essentially the ability to briefly hold and manipulate information in short-term memory (e.g., using inhibition, shifting attention, updating information; Bunge & Wright, 2007; van Dooren & Inglis, 2015; Table 1.1; Glossary). Age-related differences in performance depend on the complexity of a task (Best et al., 2009). Problems such as aggression and hyperactivity (ADHD) have been linked to poor working memory (children followed from preschool to age 15; N = 303 males; Séguin, Nagin, Assaad, & Tremblay, 2004; Séguin & Zelazo, 2005)—e.g., a 12-year-old boy, Derek, exhibited ADHD, anger outbursts, arguing, throwing things, knocking over desks, and poor functioning (e.g., social; academic—memory, math, language). The link to poor working memory suggests that children who are better equipped to mentally represent and simultaneously consider multiple options for responding (and consequences)

Box 1.4 Memory

When Kate was in her 30s she was searching for children's books. She asked her mother about the book about the upside-down train. She periodically remembered her mother reading that book to her, but she couldn't find it. She remembered sitting across from her mother on the bed, when her mother read the story. She described to her mother the features of the house, and remembered that only she and her older brother lived there with Mom and Dad, at the time. She also remembered playing in the back yard alone and finding some very interesting snails there. This confirmed her as age two. Her mother told her that it was "The Little Train that Could" and that, although the book was not about an upside-down train, she may have had a view of the train being upside down when she sat across from her mother, while she was reading. The memory of an upside-down train remained until corrected in her 30s. Because the train was upside down to a two-year-old's sight and mind, it remained so in long-term memory, until corrected.

Note:
Case examples are disguised, may be combined cases, and have had details changed to protect individuals.

may engage in more adaptive methods of problem-solving when confronted with hostile or threatening circumstances (Cassidy et al., 2017).

Memory Processing and Long-Term Memory. Although some researchers suggest that our inability to recall very early memories (before age 3.5 or 4) is because infants and young children encode information differently than older children (Box 1.4), later memory deficits also are common (Bauer, 2009; Bjorklund & Sellers, 2014; Howe, Courage, & Rooksby, 2009; Chapter 5). Normally, at age 35 or later, individuals are more likely to recall autobiographical memories from ages 10 or 15 to 30 than memories prior or subsequent (the "reminiscence bump"; Fuhrmann, Knoll, & Blakemore, 2015; Koppel & Berntsen, 2014). Koppel and Berntsen (2014) found a reminiscence bump from ages 5 to 19 for both autobiographical and public event memories (e.g., fall of Berlin Wall). Although the reminiscence bump may reflect changes across the lifespan in memory encoding efficiency, which operates optimally during adolescence and early adulthood, to be remembered, events may require significance to one's life story (see Koppel & Berntsen, 2014); be very positive (e.g., exciting, very happy), very distressing (not neutral events; Lenore Terr, 1995, committee presentation), or one's most important experiences (high and low points on a timeline); or be personal events connected to self-concept (Janssen, 2015). Depending on other variables, traumas may enhance trauma memories and interfere with other memory processes (Chapter 5).

Language Development

Language influences other developmental skills and affects functioning throughout life (e.g., social, occupational). The quantity and quality of early language exposure (e.g., parent–child conversation) are associated with the quality and rate of young children's acquisition of skilled language use (Bauer, 2009; Reese, Haden, & Fivush, 1993; Salmon, O'Kearny, Reese, & Fortune, 2016; Chapter 5). Language development is a basis for emotional, behavioral, and academic functioning—e.g., through language children learn about emotions, communicate needs and wants, learn basic rules of conduct and engagement, learn aspects of self-regulation, create and express narratives (e.g., autobiographical), develop understanding of self and others, perform in schools, and engage in social exchanges (Salmon et al., 2016). Narrative skills are emerging in the preschool years and continue to develop through adolescence (Kelly & Bailey, 2012; Salmon et al., 2016).

Late language emergence has ranged from 10–20% in the general population (Zubrick, Taylor, Rice, & Slegers, 2007, N = 1766). Such delays have persisted in 50–80% at age two and resolved in most children by age three (40–60%) or four (70%; Reilly et al., 2007). However, not all children with later language difficulties have had late emergence of language. Around 6–7% of children show speech and language delays at school entry (Boyle, 2011; Pickles et al., 2016). For preschool children, delays have been associated with family history of speech and language problems, birth order, early neurobiological growth, male gender, non-English-speaking background, parental education, dysfunctional parenting practices, lower maternal vocabulary, and older maternal age (Nelson, Nygren, Walker, Panoscha, 2006; Reilly et al., 2007; Zubrick et al., 2007). Larger studies have produced smaller lists of factors (male gender, both parents' social status, and mother's concern about child's language, Korpilahti, Kaljonen, & Jansson-Verkasalo, 2016; not being first born or only child, suboptimal fetal growth, male gender, premature birth, Zubrick et al., 2007). Lower levels of motor, adaptive, and personal social performance have predicted or co-occurred with language delays (Zubrick et al., 2007). Like many other children, those with language impairments (LI) are sociable (in contrast to autism spectrum children; Pickles et al., 2016). When LI children exhibit higher prosocial behaviors, they have more positive peer relationships and better social outcomes (Pickles et al., 2016). Failure to achieve age-appropriate language proficiency has been related to increased risk of problems in language-related cognitive and socioemotional domains, and to escalating and enduring emotional and behavioral problems (e.g., externalizing; Masten & Cicchetti 2010; Pickles et al., 2016; Salmon et al., 2016). Children with language problems have had greater risk of reading problems as well (Pickles et al., 2016). Reading problems are also linked to conduct and antisocial behavior problems. Children with comorbid conduct and hyperactivity problems have had both language and reading problems.

Internal Dialogue—The Dialogical Self

Children learn dialogue exchanges from observation, interaction, and pretend play—taking on the role of different characters and articulating a theory of that character's mind. When internal dialogue develops, it includes tendencies that influence life quality. For example, self-criticism and self-compassion have been related to negative and positive outcomes/life quality, respectively (e.g., see Iancu, Bodner, & Ben-Zion, 2015; Table 1.3; Self-Evaluation, to follow). Observation and research suggest that each person contains a multiple self with different internal voices—each having a set of wishes, needs, and action tendencies as well as a unique perspective and an at least subtly different information processing style—that vary depending on the demands of interpersonal situations, the problems to be confronted, and mood (Dimaggio, Hermans, & Lysaker, 2010). Some evidence suggests that whether these internal voices—e.g., parent self, child self, self-criticizer, self-enhancer, intellectualizer, emoter, optimist, pessimist (e.g., Hermans, 2010)—represent an adaptive or a maladaptive self is related to the nature (e.g., positive or negative) and dominance of voices as well as to an individual's awareness of them, ability to coordinate or negotiate differences (e.g., via internal and external dialogue), and integration of the different aspects of self represented in these voices (Chapter 2). Like the importance of dialogue among individuals, dialogue between parts of self assist creation of a nuanced, integrated, and adapted self. Awareness and skills for coordination and integration permit a sense of coherence and enable conflict resolution, sometimes with more effective solutions (Dimaggio et al., 2010). Dialogue is used to organize or integrate a fragmented self, enrich an impoverished self, and as a central technique of treatment (e.g., Emotion-Focused Therapy, Hermans & Dimaggio, 2004).

Social Skills

Social skills are behaviors learned from infancy that enable effective interpersonal interactions (see Mello & Nader, 2012; attachment, Chapters 4, 5). Early mother–child joint attention includes a form of information processing that is necessary to an increasing aptitude with the processing of multiple streams of information (in real time) during social interactions. Consequently, it contributes to social cognition and skill. Social skills deficits are associated with problems in school adjustment (e.g., academic performance, failure), relationships (loneliness; victimization; difficulty maintaining relationships; peer rejection; social dissatisfaction), mental health (e.g., behavioral disorders; aggression, criminality), and work (e.g., difficulty maintaining employment; opportunities) in childhood, adolescence, and adulthood (Bakker et al., 2011; Cohen, 2006; Kramer, Caldarella, Christensen, & Shatzer, 2010; Maag, 2005).

Table 1.3a Self-Concept (S-C): Self-View

ASPECT OF S-C, DEFINITIONS, AND ASSOCIATIONS
Self-Efficacy or Self-Confidence • belief in one's skills/capabilities and resources to accomplish goal-oriented strivings in a variety of or in specific domains – self-confidence may become real-world competence • self-efficacy is among resilience factors associated with positive outcomes • domains of self-efficacy: e.g., interpersonal (e.g., social self-efficacy), achievement (e.g., academic self-efficacy), physical (e.g., athletic self-efficacy), skills (competence) • perceived self-efficacy and emotional competence have proven important to children's ability to cope with traumas (e.g., CSA) • self-efficacy and social initiative have positively correlated with self-disclosure • securely attached individuals have been more likely to show high self-confidence and to express greater warmth interpersonally • in maltreated children, positive self-schemas have been associated with dissociation and may be a part of defensive self-processing (e.g., maltreated children ages 7–14 overestimated their self-efficacy in conflictual peer interactions; inflation of perceived skills may increase their sense of personal control and competence) • posttrauma treatment has sometimes increased self-efficacy (e.g., via increasing skills such as problem-solving or coping)
Self-Esteem or Self-Worth • extent to which a person approves of, values, likes, or prizes her/himself – explicit self-esteem—conscious and reflective self-evaluation (higher cognitive processes) – implicit self-esteem—characterized by automatic and unconscious self-evaluation – self-esteem via mattering—an internalized feeling of being important or significant to other people ("I matter," "I'm valued") • low self-esteem—focus is on unfavorable attributes of self – linked to poor mental health outcomes—e.g., adolescent anxiety disorder (e.g., SoAD), suicide attempts, exclusion; attentional biases toward social rejection (may be domain specific—e.g., weight, academics, approval) • high self-esteem—focus is on strengths or favorable aspects of self – positive associations—e.g., resilience; lower risk of problems (e.g., SU); positive emotions; life satisfaction; adjustment and well-being in social relationships; school achievement; resilience to stressful life events; less likelihood of anxiety or depression

Sources: Barnard & Curry, 2011; Barnett & Sharp, 2016; Brake et al., 2017; Chang et al., 2018; Donnellan, Murray, & Harrison, 2013; Flett, Flett, & Wekerle, 2015; Fraley et al., 2013; Hunter et al., 2011; Iancu et al., 2015; Jiang et al., 2017; Kolubinski et al., 2017; Lee et al., 2018; see Moran et al., 2018; see Nader, 2008; Neff, 2003; Ravary & Baldwin, 2018; Sroufe, 2018; Valentino, Cicchetti, Rogosch, & Toth, 2013; Yu, Norton, & McCracken, 2017 (for Table 1.3b as well).

Table 1.3b Self-Concept (S-C): Self-Talk—Contempt vs Compassion

SELF-TALK AND S-C Self-dialogue (criticism or compassion) may both reflect and contribute to self-concept

Self-Criticism

- the inner negative voice that judges and attacks the self (e.g., related to actions, traits)
  - persistent, negative self-judgments, some level of which are involuntary
  - in contrast to introspection or self-analysis without negative judgment
  - internal dialogue that expresses intense hostility/contempt toward the self, often after failure to meet personal high standards; can also be related to personal traits (e.g., genetics, personality)
- may lead to a perseverative, specific form of rumination (distinct from depressive rumination and from posttrauma intrusions)
  - self-critical rumination involves focusing attention specifically on self-critical thoughts
  - rather than on emotions, focus is on aspects of self of which one is ashamed and on one's overall self-worth
- rumination mediates the relationship between self-criticism and both suicidal ideation and depression
- self-criticism has been related to feelings of being a failure; mood disorders (e.g., depression); despair; guilt; anxiety (e.g., SoAD); substance use (SU); reduced self-efficacy; poor adaptation; eating disorders; psychosomatics; lower levels of problem-solving; feelings of helplessness and/or hopelessness in stressful situations

Self-Disgust

- disgust directed internally—disgust with self (e.g., physical and/or personality traits) or with personal behavior
  - as an evolutionary adaptive reaction (toward self-preservation), disgust is a negatively valenced reaction characterized by revulsion and rejection, intended to protect oneself from contaminants
  - maladaptive when directed toward self—overlaps with but is distinct from and may be more extreme than self-criticism, shame, or self-contempt
- PTSD symptom severity has been associated with self-disgust, disgust with own behaviors, and suicide risk (beyond effects of depression or gender), e.g.,
  - after controlling for PTSD severity and other covariates, only increased self-disgust was linked to suicidal risk
  - all PTSD symptom clusters related to suicide risk via self-disgust, except arousal and reactivity (not disgust with behaviors)
  - theoretically, self-disgust may increase feelings of hopelessness, burdensomeness, and thwarted belonging

Self-Compassion

- Buddhist compassion—"compassion entails being moved by and desiring to alleviate both others' and one's own distress," pain, or suffering (see Barnard & Curry, 2011, p. 289)
  - ability to respond mindfully toward the self with kindness and self-acceptance after experiencing interpersonal adversities, after committing social blunders, and/or after failing to meet social expectations
- Western self-compassion (see Neff, 2003):
  - (a) self-kindness rather than self-judgment or self-criticism
    - extending to self: empathy, forgiveness, sensitivity, warmth, and patience
    - to all aspects of oneself—e.g., all of one's actions, feelings, thoughts, and impulses
    - may include self-soothing, warmth, and compassionate self-reassurance
  - (b) personal fallibility as part of a larger human condition rather than as isolating
    - recognizing our connection to others
    - especially in our confusion, sorrows, imperfections, and weaknesses
  - (c) mindfulness
    - nonjudgmental awareness of, attention to, and acceptance of the present moment
    - holding personal painful thoughts and feelings in mindful awareness rather than avoiding/repressing them, overidentifying with them (e.g., ruminating on personal limitations), or trying to change them

- higher levels of self-compassion have been associated with greater life satisfaction, happiness, social connectedness, and emotional intelligence as well as with lower levels of anxiety, depression, shame, fear of failure, self-injury, and burn-out
- maladaptive perfectionism has been related to lower self-compassion, which in turn is related to lower body image satisfaction; people with high self-compassion are more likely to have higher body image satisfaction, and may be less likely to compare themselves to others

Friendships are both a consequence of and a learning ground for social skills (Bowker, 2004). Closeness to another person and openness in sharing thoughts and feelings are among the characteristics of intimate school-age friendships (Bauminger et al., 2008). Friendship intimacy utilizes several skills—e.g., support seeking, support-providing, negotiating, and feeling comfortable as an autonomous self (Bauminger et al., 2008). Such skills are learned in early infant–caregiver relationships. A variety of relationship rules emerge across childhood—e.g., related to compromising to prevent conflict or standing firm; staying away from or staying by someone when s/he is grouchy; being and acting independent; letting others know when you're upset vs handling it in other ways; and inhibiting behavior when indicated (e.g., Bigelow et al., 1996). Positive and stable intimate friendships have had positive effects on children's psychological adjustment (e.g., higher self-esteem) and are associated with reduced risk of psychopathology (i.e., fewer emotional problems; reduced aggression; Bowker, 2004; see Nader, 2012c). Youth who possess certain social skills and traits (e.g., agreeableness and friendliness) tend to be less often victimized than those who lack such traits or skills (Christiansen & Evans, 2005).

Normal Play

Play helps children achieve cognitive, physical, and social milestones (Capurso & Pazzagli, 2016; Zosh, Fisher, Golinkoff, & Hirsh-Pasek, 2013). Its benefits may be immediate or deferred. In general, play is associated with a sense of mastery and of well-being in children (Pellegrini & Smith, 1998; Piaget, 1962) and may assist coping (Capurso & Pazzagli, 2016; Tessier, Normandin, Ensink, & Fonagy, 2016), flexibility, and innovation (Pellegrini, Dupuis, & Smith, 2007). Play is important to brain and skill development as well as to well-being (Lipton & Fosha, 2011; Chapter 5). Play permits ventilation, working through, and the creation of a reality where there can be autonomy, control, independence, and survival and thriving in the face of adversity (Capurso & Pazzagli, 2016; Sutton-Smith, 2009). Play is important for learning to recognize and interpret social signals and others' affective states (Brown, 2014b), to respond effectively interpersonally (Pellegrini & Smith, 2005), and to self-regulate—e.g., behavioral inhibition, executive control (underlying creativity, self-reflection, and empathy; Panksepp, 2007; Tessier et al., 2016; Chapter 5). Panksepp (1998) suggests that *Play* is one of six neural-based networks that influence personality (Davis, Panksepp, & Normansell, 2003; see Chapter 4). Some medications inhibit playfulness (e.g., psychostimulants for ADHD, Panksepp, 2007).

Although normal play varies somewhat by culture—e.g., African farm children play aggressively significantly more often than African forager children (Boyette, 2016)—research has demonstrated developmental purposes for different types of play (see Nader, 2008). For example, rhythmic play is associated with neuromuscular development (Pellegrini & Smith, 1998; Chapter 5). Exercise play appears to assist the development of physical strength, endurance, and economy of movement. A break in cognitive tasks (play or other break) maximizes cognitive performance (e.g., increased attention and learning; Hirsh-Pasek, Golinkoff, Berk, & Singer, 2009; Pellegrini & Smith, 2005). Vigorous play correlates with preschoolers' abilities to decode emotional expressions, and elementary school rough-and-tumble play (R&T) is linked to an ability for decoding play-engagement

signals and establishing dominance (Pelligrini & Smith, 1998; Chapter 8). Skill sets used in careers (e.g., creativity, critical thinking, collaboration, communication, confidence) begin with playtime (Nader, 2008; Zosh et al., 2013). In play, children can take behaviors observed in adults and others and then recombine elements to use new strategies or routines (Pellegrini et al., 2007). Behavioral flexibility may emerge from encountering uncertain environments with the freedom to play. Play has predicted later performance on theory of mind tasks (Glossary; Chapter 8), mental state verbalizations during interactions, affect regulation, empathy, social competence, and affective understanding (Pellegrini & Smith, 2005; Tessier et al., 2016).

Dramatic or fantastical pretend play, specifically—involving physicalizing emotional states or traits, pretending to be human or animal characters, and/or enacting pretend scenarios—in a small group, has been related to improved emotional control (N = 97, low SES four-year-olds, Goldstein & Lerner, 2017). Some evidence suggests that children of lower SES engage in less pretend play and less sophisticated play overall than middle- and high-SES children. Studies have shown improvements in preschoolers' language, literacy skills, representation of emotional states, and self-inhibition after story-acting/dramatic play interventions (see Goldstein & Lerner, 2017).

Humor

Positive emotions, in general, are associated with better coping, improved well-being, protection from disease, and resilience in the face of loss and adversity (Papa & Bonanno, 2008). The study of humor begins with an infant's smiling and laughter and her/his reactions to the absurd or incongruent (see age-related chapters). Theories of humor include focus on developmental stages of humor (incongruity theory), some of the possible uses of humor (superiority theory), and types of incongruities (theory of the absurd, Loizou & Kyriakou, 2016; see Table 1.4; see also Tables A2.1 and 11.2). Most researchers agree that most humor includes a simultaneous manifestation of incompatible elements or a sudden contradiction of expectations (Semrud-Clikeman & Glass, 2010). Differences in the types of humor used emerge with age—e.g., related to cognitive and emotional development; creativity (Cameron, Fox, Anderson, & Cameron, 2010; Loizou & Kyriakou, 2016). Creativity influences humor and humor influences creativity. Although humor often is related to positive experiences—e.g., laughter, stress relief, and bonding—its use can be either benign or detrimental (see Table 11.2, A2.1—Adult Humor Styles).

When mature and/or skilled enough to do so, with the use of humor, a youth may relieve tension, reduce stress, regulate emotions, improve relationships, increase or maintain group unity, save face, laugh at him/herself, reduce social awkwardness, build confidence, attract or maintain attention, increase dominance or status, express otherwise difficult-to-communicate views, provide an alternative view of something, enhance memory, promote creativity, or express aggression in a socially acceptable way (Scott, Lavan, Chen, & McGettigan, 2014; Semrud-Clikeman & Glass, 2010). A sense of humor is one aspect of social competence and is, itself, an aspect of resilience (Semrud-Clikeman & Glass, 2010). A sense of humor is among traits considered attractive in self, friends, and members of the opposite sex (Del Giudice, Ellis, & Shirtcliff, 2011) and is associated with emotional well-being and personal development (Herzog & Strevey, 2008). Humor has been used for pain and anxiety management. Adaptive humor has correlated with parental warmth (Kazarian, Moghnie, & Martin, 2010); parental warmth is associated with a youth's later happiness and well-being. While under normal circumstances humor may help to relieve a child's tension or help her/him "get past" a problem, trauma can make it more difficult for children or adults to use, respond to, or have a sense of humor.

Table 1.4 Humor Theories and Observations

Theory	Aspects of the Theory
Incongruity	McGhee's (1979) Developmental Stages of Humor 1. incongruous actions toward objects 2. incongruous labeling of objects and events 3. conceptual incongruity 4. humor in multiple meanings
Superiority	Humor Produced and/or Appreciated as a Social Process (Gruner, 1978) • an attempt to feel superior to someone – to make fun of someone – to underestimate them • to ridicule someone
Of the Absurd	Mismatches from a Child's Existing Schemata (Loizou & Kyriakou, 2016) 1. funny gestures/positions/sounds/words 2. actions (e.g., violate expectations) or empowerment (e.g., violate rules, misbehave; resolve incongruities) 3. incongruous use of materials • included violation of expectation, feeling empowered when someone was in some kind of trouble
"A Day in the Life" of Toddlers	Video tracking of a day in an age group (Cameron et al., 2010; consistent with McGhee's list) 1. clowning—deliberately repeated acts/speech to re-elicit laughter; may or may not be motoric 2. teasing/playful mocking directed to, appealing to, or attempting to provoke a response 3. jokes: word play and playful language 4. Playful physical use of the body and other objects for amusement • used in primarily social-emotional functioning (affiliative) and used in exploring cognitive and linguistic functioning
"A Day in the Life" of Adolescents Ages 13–16	Video tracking of a day in an age group (Cameron et al., 2010; N = 2) • like toddlers: joking, teasing, physical play • additional types: light tones (e.g., asking can I push you, when sitting on a fence), irony, sarcasm, mocking/parody • used to maintain a positive outlook, to elicit or deflect attention or laughter, to navigate sensitive areas (e.g., sexual), to protect others, for affiliation (e.g., solidarity), for fun, for affiliation, to reduce or avoid embarrassment or discomfort, to create distance • can be benign or detrimental humor (see Table 11.2)

Sources: Cameron, 2010; Loizou & Kyriakou, 2016; see age-related chapters and Tables 5.5, 11.2, A2.1.

Humor and Neurobiology

The brain uses multiple regions for humor (Feng, Ye, Mao, & Yue, 2014; Restak, 2013; Scott et al., 2014), and it releases "feel good" neurotransmitters (hormones) when a punch line or humorous event hits home (Shibata, Terasawa, & Umeda, 2014). Laughter triggers the brain's emotional and reward centers (e.g., contributes to the release of dopamine), which help the brain process emotions and enhance pleasure (Campbell et al., 2015). Humor triggers serotonin, to lift the mood, and releases endorphins that regulate pain and stress and can induce euphoria (Glossary; Dunbar et

al., 2012). Right hemisphere brain damage may interfere with the ability to appreciate humor (Feng et al., 2014). Good, hearty laughter can relieve tension and stress, can boost the immune system—e.g., by reducing stress hormones and increasing activity among immune cells and antibodies—and help to reduce the risk of heart attack and stroke—e.g., by improving blood flow and blood vessel function (Morgan & Jorm, 2008). Thus, laughter, which usually follows appreciated humor, has demonstrated health benefits—e.g., muscle tone; cardio-respiratory; increased memory; reduced cortisol (Bains et al., 2015; Bennett & Lengacher, 2007).

Humor Styles

Adaptive humor styles (affiliative humor and self-enhancing humor)—in contrast to maladaptive humor styles (aggressive or self-defeating humor)—have predicted self-esteem and subjective happiness (Yue, Liu, Jiang, & Hiranandani, 2014; Fox, Hunter, & Jones, 2016). The kinds of humor children like and understand are influenced by age and social factors. Fox et al. confirmed that youth, like adults, exhibit distinct humor styles (Tables 11.2, A2.1). Additionally, they demonstrated that individuals use combinations of humor styles, and the combinations are differentially associated with psychosocial adjustment (see Chapters 11, 10). For example, Fox et al. found that the negative effects of using self-defeating humor could be offset to some extent when it was used in combination with other humor styles.

Neurobiological Development

Growth spurts in brain development are accompanied by disorganization in brain and behavior (e.g., approximately age three, middle childhood, puberty, and adolescence, Stein & Kendall, 2004). A pattern of overproduction, elimination, and reorganization characterizes early brain development—i.e., overproduction of synapses (e.g., in corpus collosum, anterior commissure, prefrontal associational circuitry) is followed by pruning of unused connections and emergence of new neural networks (Huang et al., 2015; Stein & Kendall, 2004). Many aspects of post-birth brain development depend greatly on experience (Bick et al., 2015). Interactions between children and caregivers shape the ultimate architecture of the brain (Schore, 2003; Siegel, 2003). From birth to age two, the human brain undergoes several dramatic changes including rapid volume increases corresponding to rapid development of a wide range of cognitive and motor functions (Huang et al., 2015). The brain has reached adult volume by two years, plateaued to three and four years, maintained until age nine, and begun to decline after adolescence. Formative periods of brain growth (e.g., early childhood, adolescence) seem to correspond to sensitive periods of development in particular brain regions. Research has found attenuated development within the medial prefrontal cortex, medial frontal gyrus, anterior cingulate gyrus, hippocampus, and corpus callosum in individuals who experienced traumas during childhood (Dackis, Rogosch, Oshri, & Cicchetti, 2012; Table A4.2). For example, Andersen et al. (2008) found the hippocampus has been maximally affected by abuse at ages 3–5 (second most strongly between ages 11–13), corpus callosum at 9–10, and frontal cortex at 14–16 (N = 26 abused; 17 non-abused, healthy comparisons). Normally, from birth to adolescence, the brain undergoes dramatic changes in connectivity and network configuration, and brain connectivity grows stronger and more efficient. For example, the default mode network (DMN) supports mental activities such as episodic memory, mentalizing, and self-projection (see Huang et al., 2015; Chapter 11). The DMN has been shown in neonate brains. In early school years (ages seven to nine), default regions are only sparsely functionally connected. Studies show that even highly connected regions of brain networks can withstand extensive damage; damage leads to reorganization of the network (Joyce, Hayasaka, & Laurienti, 2013). However, the younger the age, the more vulnerable are brain networks to targeted attacks or random failures (Glossary; Huang et al., 2015).

Although multiple systems mediate the impact of stress on development (e.g., sympathetic-adrenomedullary system, Glossary), from a developmental perspective, the key system is the hypothalamic-pituitary-adrenocortical (HPA) system (Gunnar, Doom, & Esposito, 2015). An HPA axis product, cortisol—a steroid hormone that acts in all parts of the body—is important to development, neural plasticity, and the fight-flight response. Coping with early life stress—when stress challenges but is not enough to overwhelm the child (stress inoculation)—may foster adaptation that enhances emotion regulation, cognitive control, and curiosity (and their interrelated facets) as well as diminish stress-induced HPA axis activation (Gunnar, Frenn, Wewerka, & Ryzin, 2009a; see Shonkoff et al., 2012). Accordingly, coping with early manageable stress increases prefrontal myelination (Glossary) and expands a cortical region that relates to arousal regulation and resilience (e.g., animal studies, Katz et al., 2009). Overwhelming stress seems to affect a wide range of neurobiological systems and brain structures (van der Kolk, 2003)—e.g., early interpersonal violence (e.g., extra- and intrafamilial) has led to changes in the structure and function of neural circuits that underlie emotional learning, some of which may not be measurable until adulthood (McLaughlin, Sheridan, & Lambert, 2014a; Chapter 5). Such changes have been related to a wide range of diseases and disorders (Alexander et al., 2018; Table A4.1—$DNA_{m;}$ Chapter 4).

More recent studies have shown that, after puberty, cortisol reactivity is modulated by sex hormones (testosterone, estrogen, progesterone; mixed findings on the nature of the influence; Barel et al., 2018). For adults, controlling for sex hormones has diminished the stress-related differential pattern of cortisol reactivity, suggesting a need to control for sex hormones when examining cortisol and alpha-amylase reactivity to stress. Higher levels of progesterone have been related to higher levels of cortisol reactivity to stress in some studies. Barel et al. found that reactions were different for those whose cortisol became elevated from baseline after a stress task compared to those whose cortisol was already high and did not increase. For those with initially high cortisol (not for those with increases in cortisol), higher estrogen and progesterone were linked to lower cortisol change following stress (some $N = 58$; Barel et al., 2018).

Developmental Domains: Part II—The Self-Skills

Self-regulation, self- and other-awareness skills, and emotion awareness are important to all domains of functioning—e.g., interpersonal, academic, career, communication, behavioral, cognitive, emotional functioning. Trauma or adversity may influence alterations in self-skills.

Self-Regulation

At all ages, self-regulation is essential to successful functioning (Nader & Fletcher, 2014). It includes methods by which a person's mind exercises control over its functions, states, and inner processes—effortful control, delay of gratification (Del Giudice, 2014; Rueda, Posner & Rothbart, 2005; Glossary; Chapter 5). It is present, at a basic level, from early infancy—newborns can regulate affect by looking at mother or by sucking on fingers (e.g., Kopp, 1982). Self-regulation includes self-controlled and disciplined behaviors that influence inter-relating (e.g., by inhibiting undesirable behaviors) and achievement (e.g., by enhancing goal-directed behaviors; Del Giudice, 2014). It requires the ability to stop oneself from acting on an urge or from completing an automatic reaction. *Behavioral self-regulation* is the ability to adjust behaviors according to the demands of a situation—e.g., a toddler focuses on a toy and away from a cookie that's for later; an adolescent stops her/himself from saying mean things back to someone (Box 1.5; see Koenen, 2006). *Emotion regulation* combines awareness, understanding, and acceptance of personal emotions, as well as the capacity to control emotion-related impulsive behaviors and to modulate affective responses in order to achieve individual goals or adjust to situational circumstances—e.g., calming anger or sorrow to maintain bonds with others or to concentrate (Box 1.5; Goldsmith, Chesney, Heath, & Barlow,

Box 1.5 Self-Regulation after Death of a Mother

When he was nine, Jackson's mother was murdered. Everywhere he went in his house, he was reminded of her. He cried when no one could see him and longed for her. He felt he couldn't live without her. She had been his best advocate, his comforter, and his encourager. Anyone who looked at them could see how proud she was of him and how much she liked him. He had been a confident, bright, and happy boy. His dad was like he had always been. He was friendly to people, calm, and competent. He would ask, "How ya' doin', Buddy?" Jackson wondered if his dad missed his mother. One night after one of his nightmares (he had not seen the murder but imagined it), he went to the door of his father's room and saw him crying with his head in his hands. It was a comfort to Jackson to see he wasn't alone in his grief. They cried together.

After his mother died, it was a relief for Jackson to go to school every day. He was away from the constant reminders that, instead of treasured mementos, had become reminders of her absence and of her violent death. Although it was harder than before, he could force himself to concentrate on his studies. He would come home sometimes and want to rush in and tell her something, then feel deep pain again at her absence and at the thoughts of how she was murdered. At school, he could play soccer (football) and think of the murderer when he kicked the ball to someone or toward the goal. The first time he did it in practice, his friend jumped out of the way, because he kicked it so hard. He was "lucky" at school (he was well liked). People sometimes make fun of children with dead mothers. Jackson was a secure, friendly, kind, and popular boy. His friends rallied around him. They would make jokes or get him to join in games or activities to cheer him up. He stopped himself from telling them how angry he was, stopped himself from snapping at people because he was irritable and angry and felt like they didn't understand. He let their support temporarily lift him out of the constant, painful thinking about his mother. He liked it that they cared about him and wanted him to feel better. He felt a bit of what he'd lost (his mother's support) from their efforts to make him feel better. Aunt Kathryn and Uncle Mike also helped. They brought food and helped with chores. Aunt K would sit with Jackson's head in her lap (like mother used to) and stroke his head. She didn't mind if he cried, and he knew that she really loved him. She took him to a therapist, and he could tell the therapist about his angry, "mean" feelings.

Note:
Case examples are disguised, may be combined cases, and have had details changed to protect individuals.

2013; Gratz & Roemer, 2004). Inhibiting emotional distraction and/or negative affect are aspects of emotional self-regulation (Barry, Kochanska, & Philibert, 2008; Kochanska, Philibert, & Barry, 2009; see Nader & Fletcher, 2014). While emotion-regulatory goals and skills generally increase with age (Gross, 1998), an ability, at a young age, to delay gratification and to inhibit or delay responses is a good indicator of ability to self-regulate in adolescence (Eigsti et al., 2006). At least in part, because children have different coping repertoires, tendencies, or capacities, which may be influenced by attachment and social competence, self-regulation varies among children of the same age.

Conscious versus Automatic Regulation

Regulatory processes may be automatic or controlled, conscious or unconscious, and may occur at one or more points in the emotion-making or behavior-choosing process (Gross, 1998).

Self-regulation efforts include a number of types of conscious actions (see Nader, 2012c). For example, a child may regulate emotions or behaviors by approaching or avoiding specific people, places, or things—e.g., individuals who encourage certain behaviors or elicit certain emotions. After traumas, avoidance of reminders may be unconscious or conscious attempts to regulate emotions and reactions. Another conscious regulation method involves modifying a situation or one's reaction to it in order to alter its emotional or behavioral impact (e.g., problem-focused coping). An individual may adapt to a situation, for example, through self-talk or reappraisal of the situation—e.g., reframing, intellectualizing, isolating, or denying—or through attempting to regulate physiological and experiential aspects of emotion with calming techniques (e.g., deep breathing, meditation, or mellowing visualizations), exercise (e.g., running; gym visits), or other self-soothing methods—e.g., muscle massage; *walking it off*—involves taking oneself out of the setting, exercise, and change of focus. Additionally, youth may alter attention—e.g., by self-distracting; focusing elsewhere such as on a different goal or on specific aspects of a situation (Gross, 1998). Youth can change emotional responses by imagining something that elicits different emotions. When disrupted by distress or trauma, these skills may be regained in treatment interventions.

Self-Regulation and Outcomes

Childhood self-regulation skills predict later behavior problems in youth (Causadias, Salvatore, & Sroufe, 2012) and predict health, financial, and criminal activity outcomes in adulthood (Moffitt et al., 2011). High self-control has been related to intellectual achievement; low self-control has been related to conduct disturbances and criminality (Boisvert et al., 2013). Youth with higher levels of self-regulation have been less affected by the influence of deviant peers (Dishion & Patterson, 2006). Not all high self-control yields positive outcomes. Both *overcontrollers* and *undercontrollers* have difficulties (Block & Block, 1980; Caspi, 1998; see Nader, 2008). For example, chronic hostility and inhibition of anger both are associated with hypertension and coronary heart disease (Gross, 1998).

Because emotions often influence actions, emotional and behavioral self-regulation may both be necessary in a given situation. As well, individuals may experience dysregulation in both positive and negative emotional systems (Linehan, Bohus, & Lynch, 2007; Weiss, Gratz, & Lavender, 2015). For example, impulsive tendencies in response to intense positive emotions have been linked to clinically relevant maladaptive behaviors—e.g., drug and alcohol use, gambling, and risky sexual behavior (Cyders, Flory, Rainer, & Smith, 2009; Weiss et al., 2015). Under normal circumstances, ability to self-correct in response to the environment and/or to anticipate the future can assist self-regulation (Del Giudice, 2014). In moderately unpredictable environments (e.g., potentially dangerous), monitoring the environment with moment-to-moment self-correction (i.e., adaptation or adjustment) can be advantageous—e.g., for youth who live in neighborhoods with frequent violence.

Self-Awareness

Self-awareness can be defined as the degree to which a person comprehends her/his personal attributes, beginning with physical self-awareness, and later including strengths and weaknesses, emotions, values, interests, and impact on others (Denham, Ji, & Hamre, 2010; London, 2003; Table 5.4). Self-awareness assists social interactions as well as personal development and success (London, 2003; Mundy, Gwaltney, & Henderson, 2010). According to Avolio (2004), self-awareness is integrally entwined with social sensitivity and confidence in interpersonal relationships. Self-awareness, from an emotional growth perspective, requires the ability to self-reflect (London, 2003). Self-evaluation involves some form of self-representation (Bandura, 2012). Life experiences are processed through the self-referential system with some personal investment in what one is doing or accomplishing (e.g., Bandura, 2008). Some believe that self-awareness leads

to self-regulation, which, in turn, increases self-development (London, 2003). Posner and Rothbart (2007a) have argued that an infant's intentional use of shifts of attention to manage arousal and conflict is a primary step in the development of self-awareness and self-regulation. Autistic children demonstrate early impairments in the capacity for rapid, integrated processing of self-referenced and other-referenced information, with cascading effects on the development of self-awareness (Mundy et al., 2010). For autistic and non-autistic children, early attention-sharing efforts—coordinating attention with a social partner (e.g., in infancy, with a parent)—assist ongoing social learning. Joint attention involves self-referent information (i.e., information about self), information about another (i.e., their attentional efforts), and information about an object or situation.

Self-Evaluation

Self-evaluation influences other traits such as self-esteem, self-confidence, and outlook. More than one conceptualization has been used to assess self-concept and its outcomes (see Table 1.3a–b). Contextual Behavioral Science delineates three aspects of self-concept: *self-as-content* (the narrative self; self-schemas); *self-as-process* (in-the-moment verbal and experiential self-awareness); and *self-as-context* (the transcendent self; third-party perspective, metacognitive monitoring; Moran, Almada, & McHugh, 2018). Rigidly believing that self-schemas are actual truth or over-conceptualization of self may lead to dysfunction (e.g., feeling inadequate, unlovable; greater distress). In contrast, the observing self (-as context) enables self- and other-skills and has been related to lower depression (see Moran et al., 2018).

Self-esteem and social confidence are influenced by many factors including attachment security; family, peer, and teacher evaluation; and performance (e.g., at school; see Nader, 2012c). Successful people generally outperform less successful people in forming accurate judgments of how well they performed (Bass & Yammarino, 1991). Qualities such as intelligence, internal locus of control, and an achievement orientation also have been associated with self-evaluation accuracy (Glossary; London, 2003). While for some, self-monitoring is a part of self-awareness processes, evidence suggests that perpetual self-monitors are greatly influenced by group rather than internal dispositions and values, and they may be high in apprehension about the evaluations of others (London, 2003; Pontari & Schlenker, 2000; see the Dialogical Self, Chapter 2). Severe self-reflection deficits are linked to poorer verbal memory, lower insight, and poor social functioning, and with increased emotional withdrawal and paranoia (Dimaggio et al., 2010).

Although poor self-esteem has been associated with high rates of poor mental health outcomes (e.g., high stress levels, anxiety, victimization) and suicide attempts (see Table 1.3a), attempts to build adolescent self-esteem to improve mental health have frequently failed or had negative outcomes (see Iancu et al., 2015; Moran, Almada, & McHugh, 2018)—e.g., aggression, narcissism, bullying, a self-serving bias, avoiding constructive feedback (see Moran et al., 2018). Some current treatments address self-talk/dialogue, including the tendency toward self-criticism versus self-compassion (see Table 1.3b). Self-compassion has been enhanced by methods like mindfulness (e.g., Chapters 10, 16) and other practices (e.g., Chapter 16—AEDP, yoga).

Shame and Guilt

Both shame and guilt are self-conscious emotions that may include intense feelings of regret, responsibility, and desire to make amends (Tangney, Miller, Flicker, & Barlow, 1996; see Nader, 2008). Although some researchers suggest that individuals either are shame-prone or guilt-prone (Tangney, 1990), Tangney and colleagues (1992) found a positive correlation between guilt- and shame-proneness in college students. Guilt focuses on behaviors—actions, inactions, survival, or omissions—that are inconsistent with internalized standards (Tangney, 1990). It often includes a nagging preoccupation with a specific transgression (Tangney et al., 1996). Young children are

predisposed to see themselves as causes of events (ages 2–6, see Fletcher, 2014; Chapters 5, 8). Shame is a product of negative self-evaluation rather than of evaluation of specific behaviors (Tangney, 1990). The self observes and disapproves of personal shortcomings of the *defective self* (Tangney et al., 1996).

Emotion Awareness: Understanding and Labeling Emotions

The ability to identify emotions has a survival function—e.g., a child must recognize that fear in the face of danger means s/he must seek protection, comfort, and safety (Baldwin, 2013). Even when some skills decline (e.g., at puberty onset), survival-related skills remain intact (e.g., fear and disgust recognition, Blakemore & Choudhury, 2006). Children learn emotions from their caregivers and often reflect their caregivers' emotional expressiveness—e.g., fear, anger, happiness (see Berk, 2009; Box 1.6). Emotions influence cognitive processes (e.g., decision-making, assessments, attention, concentration), behavior (e.g., rapid motor responses; action choices), and social responses (e.g., accord vs discord; e.g., Gross, 1998). In addition, emotions inform expectations (e.g., of threat or reward; others' behavioral intentions) and evaluations (e.g., of the positive or negative value of something).

Box 1.6 Child Mirrors Parent's Distress

Alana, who wasn't used to being a speaker, gave a talk to a group of friends, acquaintances, and strangers. When she went to the front of the room, she welcomed everyone and began the social preliminaries before beginning her talk. Her two-year-old son started to cry. She explained that she wasn't used to public speaking and that young children often reflect their parents' emotions. "Now you know how I feel," she said.

Note:
Case examples are disguised, may be combined cases, and have had details changed to protect individuals.

Emotion Awareness Skills

Emotion awareness skills include those related to self, others, and groups (see Alonso-Alberca et al., 2012). They are linked to an ability to adapt. Emotion self-awareness skills consist of the abilities to recognize, express, and label personal emotions correctly. Other-related emotion skills include the ability to recognize and understand others' emotions in facial expressions, voice, and/or behaviors. Both skills include the ability to identify causes or triggers of emotions and to anticipate resulting emotions. As well, an individual must be able to make associations between social rules and emotions, to express emotions in culturally acceptable manners, to cope with negative emotions, and to understand how emotions influence human relationships. Girls tend to have greater emotional knowledge than boys (perhaps due to maturation and socialization differences; Alonso-Alberca et al., 2012).

Emotion awareness begins in infancy and is influenced by the caregiver–child relationship (Tables 5.4, A4.1—oxytocin). Perhaps because fearful facial expressions may convey important threat-related information, even in infancy, neurological responses to fearful faces are greater than to happy or neutral faces (Bick et al., 2017; Taylor-Colls & Fearon, 2015; Chapter 5). Recognition of sad faces continues to mature into late childhood and adolescence (Bick et al., 2017). As early as age six and generally by age 11, children are able to understand mixed or blended emotions, and

diverse emotions arising in one person toward another person or situation (Steele & Steele, 2005). Children first recognize, reflect on, and make judgments about their own emotions; then they generalize to other people. Often, a child's social competence is assessed based on the type/nature, frequency, and duration of her/his expressed emotions.

Taking the Perspective of Others and Empathy

Perspective-taking—ability to understand the perceptual, cognitive, emotional, or motivational reactions of other people, even when they are different from one's own (Boltz et al., 2015; Table 1.2)—has been described as the ability to *walk in another's shoes* or as imagining the world from another's vantage point or frame of reference (see Boltz et al., 2015; Galinsky, Ku, & Wang, 2005). Cognitive empathy (perspective-taking), affective empathy (sharing of emotional states), and somatic empathy (bodily reactions) have been studied as distinct aspects of empathy (Liu et al., 2018; Glossary). Perspective-taking does not require identification with another; it involves simply recognizing another's emotions. Affective perspective-taking is believed to elicit stronger empathic concern and responding (more helping). Perspective-taking is critical to an ability to differentiate between personal and others' emotional reactions (e.g., distress; Schonert-Reichl, 2012). It has a survival value (Decety & Jackson, 2004)—e.g., it helps to recognize the intentions of others and helps courtship (important to perpetuating the species).

Perspective-taking requires cognitive as well as other skills (e.g., mirroring). Even though similar past experience may not influence emotions toward another person, similarity between one's own and another's past experience makes it subjectively easier to take that person's perspective—especially with greater similarity and more reflection on the experience (Gerace, Day, Casey, & Mohr, 2015; N = 164). Human offspring first learn about perspectives within the context of joint attentional engagement (sharing perceptions and experiences, Moll & Meltzoff, 2011; Tables 5.3–5.4). That is, the early ability and motivation to jointly attend to objects and events with caretakers/others lays the foundation for later perspective-taking. Perspective-taking is enhanced by social experiences (e.g., with siblings) and by good language skills. With increasing maturity, children take into account more information relevant to a situation. They realize that different people can react differently or view things from a different vantage point. They begin to be able to assess the perspectives of several people from a third-party, unbiased perspective, and they can imagine how culture, group, or social values influence perceptions (Selman & Byrne, 1974).

Currently, egocentric thinking is most people's default perspective (Knowles, 2014). As well, some evidence suggests a decline in empathy in the US between 1979 and 2009 (Konrath, O'Brien, & Hsing, 2011), along with an increase in narcissism and individuality (and a decrease in donations and volunteering; Boltz et al., 2015). Understanding instructions requires an ability to perceive what another is perceiving (from their vantage point) and may include recognition of the person's goals or beliefs. Studies show that around half the time, even adults fail to use information about another's perspective and instead use their own (egocentric) viewpoint when trying to follow another's instructions (Hillebrandt, Dumontheil, Blakemore, & Rosier, 2013).

Perspective-taking includes understanding how objects look to another person (e.g., concrete objects, circumstances) as well as how another feels and thinks. For adults, correlation was found between the ability to take the visuospatial perspective of another (Erle & Topolinski, 2015)—e.g., recognizing what they are viewing (Bukowski, Hietanen, & Samson, 2016)—and empathic perspective-taking. Individuals who use perspective transformations generally have performed better on visuospatial perspective-taking tasks than those who employ object rotation. Conson et al. (2015) found that individuals with AuSD mainly rely on mental object rotation, whereas typical youth adopt an imagining oneself in the other's position strategy. Youth with AuSD also had more difficulties inhibiting other-perspective when directed to keep one's own point of view.

Mirror Neurons

Emotions, actions, and sensations (e.g., physical touch) experienced by one individual are activated automatically—in the same neural network—in an observer of those emotions, actions, and sensations, via the brain's *mirror neuron system*. Hence, both experiencing and witnessing disgust on another person's face activate the same neural structure at the same overlapping location (Gallese, Eagle, & Migone, 2007). Observing a picture of a facial expression has resulted in spontaneous and rapid electromyographic responses in the observer's corresponding facial muscles. The mirroring response occurred even when a final critical part of the observed action was hidden and even when only associated sounds were produced (e.g., eating noises). The shared neural activation pattern and its results may constitute a fundamental biological basis for understanding another's mind and mental states (Gallese et al., 2007). Empathic response does not literally mirror another's behavior; rather empathic attunement enables empathic understanding, which can eventually lead to complementary or modulating responses to another. Children with AuSD and those with pervasive developmental disorder appear to have a deficit in the mirror neuron system, even though non-social intelligence may be preserved in AuSD (Brüne & Brüne-Cohrs, 2006; Dawson et al., 2002; Gallese et al., 2007; Kajiume et al., 2013). Reflective neural activation also has implications for the therapy process. Physical mirroring may occur when rapport or connection is established. A therapist is likely to experience feelings and emotions similar to the patient's, including the patient's unconscious attempts to induce certain emotions in the therapist.

The Need for Perspective-Taking

Perspective-taking skills are important to the ability to have empathy for others, to appropriately interpret and respond to others' behaviors, to influence others, to create narratives, to foster harmony, and to express and understand humor (Schonert-Reichl, 2012; Semrud-Clikeman & Glass, 2010). For adults, it is a part of leadership skills and can be protective—e.g., physicians perceived as empathetic have fewer malpractice suits, higher patient treatment-adherence, better clinical outcomes, and higher patient satisfaction (Boltz et al., 2015).

Narratives. Pragmatic skills—e.g., ability to initiate conversations, respond socially, and acknowledge turn-taking cues—and an appreciation of the role of mental states in predicting and explaining behavior are essential to the ability to narrate stories—e.g., autobiographical and storytelling (Fernandez, 2013). Narrative development is apparent in increasing ability to integrate, logically and cohesively, an individual's motivations and the role of mental states in predicting and explaining behavior as well as apparent in the ability to provide a sequence of events and themes that form a story (Fernandez, 2013; Peterson & McCabe, 1991). Young children's narratives tend to increase (ages three to five) with a mother's prompting and early elaborative speech (Chapter 5).

Overcoming Rejection. Social threat appears to motivate a shift to others' perspectives—i.e., rejection increases social perspective-taking (Knowles, 2014). Perspective-taking may be adaptive for the socially rejected, because it improves social coordination, fosters social bonding, and may permit better understanding of reasons for rejection (Galinsky et al., 2005; Knowles, 2014). Although cognitive busy-ness disrupts a shift in perspectives that normally occurs after rejection, rejected people have been motivated to exert extra effort to take others' perspectives (Knowles, 2014).

Fostering Harmony. Perspective-taking is important to increasing social bonds and social harmony (e.g., Galinsky et al., 2005) and to reducing conflict between groups. Both empathic concern and perspective-taking are common targets in prejudice reduction interventions (e.g., see Levin et al., 2015). Evidence suggests that perspective-taking leads people to see more of themselves in others, and it affects how they evaluate and describe others (Galinsky et al., 2005). When someone takes a person's perspective, they are more likely to see the person, their point of view,

and their peer groups in a much more positive light (Goldstein, Vezich, & Shapiro, 2014). Both taking the perspective of another and perceiving another is taking one's own perspective have been associated with an increased liking for, greater sense of self–other overlap, compassion toward, and more help provided to that person (i.e., more prosocial behavior, Goldstein et al., 2014). Perspective-taking efforts must be perceived as successful to enhance self–other effects.

Fostering Empathy. Empathy has positively correlated with an ability to identify and describe personal emotions and to recognize others' perspectives (Grynberg et al., 2010; Table 1.2). These skills are believed to foster empathy and sympathy and, thus, foster more and higher-quality prosocial behaviors. For example, youth who engage in altruistic and other forms of helping behaviors generally have good perspective-taking skills, among other qualities—e.g., sympathy, a sense of responsibility (Eisenberg, Fabes, & Spinrad, 2007; Laible, Eye, & Carlo, 2008). Youth who perpetrate social cruelty (e.g., relational or physically aggressive bullying) tend to lack empathy, compassion, and, sometimes, lack perspective-taking skills (Cunningham, 2007; Nader, 2012c). However, children who bully or manipulate others may be good at understanding others and use it for gain or effect. Children who are well liked are less likely than poorly liked children to have negative outcomes—e.g., psychopathology, behavior problems (see Gerson, Bekkering, & Hunnius, 2017). Children who are good at understanding others' motives are often more popular.

Conclusions

Stress and trauma can have deleterious effects on children, including effects on important developmental domains. Stressors may negatively influence brain and skill development. Among the domains influenced by parenting, trauma, stress, and other variables are executive functions, language skills, social skills, normal ability to play, humor, and self-skills—e.g., self-regulation, self- and emotion awareness, and perspective-taking skills. Skills are interrelated and build on earlier stages of development. Interruptions in skill development may cause significant problems.

For optimal development, infants and children need sensitive, synchronous, and trustworthy care in an enriched environment. The absence of these, failure of protection, or exposure to trauma may waylay the progression or emergence of developmental skills. From a prevention perspective, it is essential to recognize the levels of adversity that may undermine life trajectories for specific age groups. Pre-natal and early environmental conflict, caregiver separations, and recognized traumas (e.g., violence, disasters, neglect) may handicap a child through life (e.g., in goal achievement, interpersonally, emotionally; Boxes 3.1, 3.2). As shown in deprivation studies (e.g., institutional or parental neglect), without timely repair, lack of sensitive care, synchrony, and appropriate, enriching stimulation for an infant or young child may have ongoing ill effects on development, mental health, and quality of life (e.g., Young et al., 2017). For children, treatment of faulty caregiver–child relationships is as important as other posttrauma interventions.

2

Effects of Trauma and Adversity on Developmental Domains

According to Sapolsky (1998), trauma is one of the means by which an individual is "no longer himself" but is a product of "the biology that is distorting him." Non-traumatic adversity—e.g., pre- or post-natal family conflict; faulty attachments; child chronic illness, homelessness—as well as traumatic adversity may disrupt or influence brain, personality, and skill development. Both can be significantly life changing—e.g., lead to an over-reactive stress response system (e.g., HPA axis). Adverse experiences that may traumatize happen daily, worldwide. Around 70–80% of adults and two thirds of children have been directly exposed to traumatic events (Breslau, 2009; see Nader & Fletcher, 2014)—e.g., severe accidents (e.g., vehicle, plane, ship; oil tanker; burns); disasters such as fires (e.g., wildfires, residence/building fires, arson), floods, hurricanes (e.g., Florence, Harvey, Irma, Katrina; Boxes 1.1, 1.2, 3.4, 13.2), earthquakes, tornadoes, mudslides, and avalanches; parental death; interpersonal violence such as child abuse or neglect, sexual crimes, inter-parental abuse, school shootings, other violent crimes (e.g., assault, murder, armed robbery, Boxes 2.1, 3.2), wars (Boxes 2.2b, 13.1, 16.3); and more. Children also have endured losses during or related to traumatic events and/or have endured the perpetual stress of displacement from home, deprivation, community violence, or having a parent away at war. Potentially traumatic events appear to have increased, e.g., since warming trends have combined with natural events (e.g., hurricanes, fires; Lindsey, 2017), and the internet has been used for bullying or to encourage terrorism. For example, vehicles plowing into crowds increased after a terrorist website advocated it.

Most children show resilience after traumatic events (up to 70%). Nevertheless, trauma may delay or interrupt a number of developmental skills (e.g., self-skills) and result in a wide variety of symptoms. Across 27 studies of neuropsychological functioning, compared to non-exposed comparisons, a significant number of trauma-exposed children ages 0–18 showed cognitive deficits, visuo-spatial deficits, poorer language skills, deficits in information processing, learning and memory problems, and poorer executive skills (Malarbi, Abu-Rayya, Muscara, & Stargatt, 2017). Those with posttraumatic stress disorder (PTSD) showed lower intelligence levels and visuospatial skills than without PTSD. Some traumas (e.g., deprivation) may alter the neural correlates underlying multiple cognitive domains, and may not be fully reversible (Stamoulis et al., 2017). Evidence suggests a more persistent course of PTSD for children compared to adults (Scheeringa, 2011; Scheeringa, Zeanah, Myers, & Putnam, 2005). As will be seen in age-related chapters, general stressors also may define a child's life trajectory—e.g., early family conflict may alter personality and functioning. Insecure attachments to caregivers may shape a child's need-driven behaviors and style of inter-relating with others across life (Chapter 4; Tables A3.1–A3.4).

Box 2.1 Trauma and Attentional Focus

- John, age 10, was walking home from school when he realized the popping sound was gunfire. A boy dropped, bleeding, and a teenage boy with a gun ran away carrying a satchel. The boy looked right at him and pointed his gun at him, but he didn't fire. He pulled out the phone his mother gave him for emergencies and called 911, but the whole time he was afraid the shooter would come back and kill him, because he saw the whole thing. He had nightmares. Every time he heard a "pop" or a "bang" in the classroom, he jumped and turned to see what it was. He couldn't pay attention in school, because he was looking for the next bad thing to happen, was distracted by sounds, felt anxious and antsy, and feared the shooter would find him and shoot him, because he called the police.
- Celia, age 11, was molested repeatedly by her live-in uncle until she was removed to a foster home. In school, the teacher said she would space out a lot or seem to be daydreaming and didn't pay attention in school (dissociation).

Note:
All case examples are disguised, may be combined cases, and have had details changed to protect individuals.

Box 2.2 Long-Term Memory and Trauma

a. When she was 2.5, JA was molested by a male, adolescent babysitter (Hewitt, 1994). She became aggressive, angry, had disturbed sleep, could not be soothed or calmed, and had expressive language and social skill lags. Her parents disciplined her for her infractions by spanking her. At age four, when her mother began to educate her about not letting anyone touch her bottom, she revealed that her cousin had done so. After disclosure, sleep and behavior problems diminished. Despite earlier speech and language problems and reduced language when the abuse occurred, JA clearly articulated the details of the abuse to a therapist (see Hewitt, 1994 for more detail).
b. When Luka was 10 and her little sister was three, they experienced the chronic stress of war. When Luka was 12, they moved to a northern European country. When she was an adolescent, she and her girlfriends would sit around talking. On any given topic, Luka gave more general memories rather than the elaborate descriptions of experiences given by other girls her age who had not been exposed to war. For example, when asked what she did for the holidays, she might say, "We went to Serbia. There really wasn't anything to do there" without telling that she stayed with her grandmother, saw relatives for the first time in years, and visited places where she had played as a child and had been afraid during the war. Her friends provided descriptions of multiple activities and experiences—e.g., movies, feasts, presents, people—with details such as their feelings and how things looked. When asked about what made her afraid or when she felt the happiest, Luka might say, "When I lived in Serbia" without elaborating.

Note:
All case examples are disguised, may be combined cases, and have had details changed to protect individuals.

For children with or without PTSD, trauma's effects may evolve over time—e.g., with age-related changes in understanding, in perceptions of what is most relevant, or in significance issues might have (Nader, 2008). Because growth is not always linear, it may not be easy to recognize such changes in youth (Casey, Jones, & Somerville, 2011)—e.g., a normal plateau or lag occurs in some skills following puberty onset (Blakemore & Choudhury, 2006). Additionally, secondary stressors after traumatic events—e.g., lost property, jobs/incomes, resources, status, locations, routines—add to a child's stress and sense of loss. For example, after Hurricane Katrina, although gender and exposure levels accounted for most of the variance in PTSD symptoms (62%), stressors such as loss of clothes and toys, damage to a home, parent's unemployment, moving to a new place, going to a new school, moving away from friends, and/or living away from parents strongly related to the degree of PTSD symptoms as well (35%; Osofsky et al., 2009).

After traumas, a number of symptoms are common to all age groups but may manifest differently and require different versions of an intervention (Nader, 2008). For example, while children below a certain age tend to take things literally and concretely, increased concreteness has been observed in trauma victims of all ages (Punamäki, Qouta, & El-Sarraj, 2001). All age groups may regress following traumatic events. Accordingly, the ways that supporting individuals assist for these problems are likely to vary somewhat by the youth's age, personality, and symptom set as well as by functioning age level. For moderately or severely traumatized children, after a few weeks or months, parents sometimes seem to forget what was normal for a child—e.g., related to initially reported new symptoms, a year later a parent may say, "S/he was always like that" (Nader, 2008). Such a parental or peer attitude may add to a youth's sense of loss and may affect what a clinician learns about a child. Some of the possible effects of stress and/or trauma on developmental domains (see Chapter 1) are presented briefly here and are discussed in age-specific chapters. After a discussion of general distress, life trajectories, and poly-victimization or cumulative trauma, this chapter discusses the stress response system and discusses trauma's impact on specific developmental domains, on self-skills, and on psychopathology.

General Distress

Although there are many studies on variables such as attachment or divorce, few studies were found that specifically assessed children's general distress rather than their traumatic stress exposure and reactions. In addition to the effects of chronic or severe stressors, distress that is considered non-traumatic, such as stress with parents, in school, and/or in communities, has been associated with problems similar to those found for traumas—e.g., misattributions of emotions, ADHD symptoms, and difficulties in problem-solving (Fishbein et al., 2009). Even light levels such as no relief from nighttime light exposure or low levels of winter light have been related to anxiety and depression (Fonken et al., 2009). Low socioeconomic status (SES) has been associated with cognitive delays and emotional problems (e.g., 6–13 IQ points lower than norm; Britto & Noble, 2014). Having a depressed mother has been related to increased chronic and episodic stress with peers, with mothers, and with family (Feurer, Hammen, & Gibb, 2016). Insecure attachments have been related to poorer social skills, and temperamental negative or inhibited children have also had social difficulties. Supervisory neglect (Glossary) or inconsistent care has been related to reduced emotional well-being, anxiety, and depression (Font & Berger, 2015). Parental divorce has been linked to the risk of mental health problems (Chapters 9, 10; Boring et al., 2015; blunted cortisol, Mahrer et al., 2014 [see Chapters 4, 6]). Lack of having a best friend has been related to a number of risks—e.g., increased loneliness, risk of victimization by peers, lack of social skills, increased timidity and sensitivity, internalizing, guilt, and anger (Rubin, Bukowski, Parker, & Bowker, 2008). Whereas popular children have been described by observers, teachers, and peers as friendly, cooperative, sociable, sensitive, and rarely interfering with the goals of others, rejected children were described as either withdrawn, timid, and wary or as aggressive and disruptiveness (see Rubin et al., 2008). Aggression

and disruptiveness have led to rejection, unless children had other positive qualities or, in older child groups, were male.

General negative affect (e.g., anger, sadness, or anxiety) has interfered with the ability to attend to environmental stimuli and to persevere through difficult tasks, and undifferentiated negative affect (lack of discrete emotions) has significantly predicted lack of planning and impulsivity (Tomko et al., 2015; Chapter 3). Attachment issues, which may arise from and/or translate into distress in family relationships, are discussed in Chapter 4 and in age-related chapters. Insecure and disorganized attachments with caregivers and related styles of inter-relating have been associated with troubled interpersonal relationships, aspects of behavior (e.g., lower empathy and lower prosocial behavior), and mental health problems across the lifespan (e.g., Magai, Frias, & Shaver, 2018; Shaver et al., 2018). Personality and genetic factors that may relate to distress (e.g., negative emotionality; stress sensitivity) are also discussed in other chapters.

Parents' own distress and parenting have also influenced children's development. Parental distress is believed to interfere with sensitive parenting (De Vries et al., 2017; Giallo et al., 2015). As will be discussed in Chapter 11, fathers' persistent and increasing distress and hostility has been related to lower positive parenting than shown by low-distress fathers (Giallo et al., 2015). Fathers' self-reported pre-natal stress and hostility and harsh discipline in the child's preschool years as well as mother-reported family distress have been linked to child's early elementary school bullying behavior (peer nomination; De Vries et al., 2017; Chapter 12). Mothers' distress after divorce has been related to blunted cortisol in young adulthood for children, and, for adolescents, it marginally predicted blunted cortisol in young adulthood (if childhood stress was low; blunted cortisol is linked to psychopathology, Mahrer et al., 2014; Chapter 6). The separation of children from their parents became a topic of concern after the Trump administration separated illegal immigrant children from their parents. Evidence has shown that childhood separations from parents can have deleterious effects on life trajectories (e.g., psychopathology, Paksarian et al., 2015; Chapter 7). A robust body of evidence has shown that early institutionalization has been related to developmental damage across diverse domains—e.g., cognitive function, neurodevelopment, physical growth, behavior, and social-psychological health (see Berens & Nelson, 2015). Effects have been especially pronounced when individualized caregiving is low, and when deprivation coincides with sensitive periods of early development.

Some researchers have included emotional abuse among a list of stressors, while others recognize it as a form of traumatic stress. Emotional abuse includes such parental behaviors as thwarting of the child's emotional needs, persistently or extremely; insensitivity to a child's developmental level; communicating that the child is flawed, unlovable/unloved, worthless, unwanted, unsafe, or only there to meet another's needs; and/or exploiting or rejecting, spurning, or terrorizing (see Spinazzola et al., 2014). Emotional neglect includes parental lack of emotional attunement, nurturance, and responsiveness. The results for the child may include such problems as poor sense of psychological safety, a variety of maladaptive problems and behaviors, and/or disrupted normative development with such problems as poor emotion regulation, low self-acceptance and -esteem, low autonomy, and poor self-sufficiency. Even having a mother who does not find a child pleasing has been linked to problems in the child's development (e.g., language delays; Sylvestre & Merette, 2010). For a national sample of children with lifetime histories of maltreatment, although profiles were distinct from physical or sexual abuse, psychologically maltreated youth exhibited greater or equal baseline levels of behavior problems, symptoms (e.g., PTSD, internalizing), and disorders as physically or sexually abused youth (N = 5616; Spinazzola et al., 2014). Psychological maltreatment was the strongest predictor of internalizing and of substance abuse. It predicted externalizing as well as physical abuse and better than sexual abuse. When psychological maltreatment co-occurred with physical or sexual abuse, it exacerbated most outcomes, suggesting its importance as a focus of intervention for youth.

Both distress and traumas may interfere with body regulation. For example, both stress and trauma have negatively affected sleep regulation, which in turn can have negative repercussions

across the lifespan (APA, 2013; Marks, 2018; Chapters 5, 7, 8, 9, 12, 15). Sleep influences functioning throughout the day—e.g., coping, cognitive ability, self-concept. Studies have shown an association between sleep deprivation and increased stress as well as a number of other poor-sleep-related negative outcomes such as obesity, depression, pain, low quality of life, and health problems (e.g., osteoarthritis, inflammatory diseases; adult studies, Marks, 2018). A history of childhood adversity (e.g., emotional neglect) has been related to poor sleep during stressful life transitions, such as entering university (John-Henderson, Williams, Brindle, & Ginty, 2018). Poor sleep may exacerbate problems that interfere with sleep. For example, pain or stress may interfere with sleep, and poor sleep may worsen pain or stress. Stress and trauma also have been related to dysregulation in eating habits—either in under- or overeating (e.g., eating disorders; Chapters 3, 4, 15).

Life Trajectories

Although traumas also may be followed by growth and other positive consequences (Box 6.3, Chapter 7—grief), negative effects of trauma may be persistent, cascading, or evolving (Boxes 3.1, 3.2, 3.5; Chapter 3). For children, life trajectories may be undermined greatly by stress that overwhelms or persists; by traumatic reactions and altered neurochemistry; by failure of the caregiver–child relationship to protect, soothe, teach, delight in, and provide sensitive care for a child; and by difficulties contributed by genes and temperaments. Feldman (2015) found that war-exposed children with chronic PTSD were much less competent in meeting the next developmental transition from early to middle childhood (ages 2–5, 7–8). They showed the worst stress-hormone-related outcomes (e.g., cortisol), affiliation-hormone-related outcomes (e.g., oxytocin), relationships with parents, and psychopathology. Personality and/or attachment styles may contribute to posttrauma outcomes, and/or become exaggerated or changed following traumas. Parenting and attachment issues cannot be ignored at any age. Combined symptoms or disorders have been even more foreboding. For example, youth with both anxiety and depressive problems have shown greater chronicity, higher recurrence and suicide rates, greater functional impairment, poorer treatment outcomes, and greater mental health service utilization (Moser et al., 2015a). All of these issues must be addressed in preventive or posttrauma interventions. As a society and as clinicians it is our responsibility to provide protections, preventive measures, treatments, and repairing experiences to permit and promote each child's normal life trajectory. For example, among preventive interventions, school programs are associated with increased resilience and reduced posttrauma symptoms (Chapters 13, 16).

Poly-Victimization or Cumulative Trauma

Cumulative trauma—multiple traumas, especially multiple types of trauma (Briere, Dietrich, & Semple, 2016; Cloitre et al., 2009)—or *poly-victimization* (Finkelhor, Ormrod, & Turner, 2007)—exposure to multiple types of trauma—is associated with increased symptomatology (Glossary; Ayer et al., 2018; Finkelhor, Shattuck, Turner, & Ormrod, 2014), with significant comorbidity (Hodges et al., 2013), with symptom complexity, and has explained a large proportion of associations between individual forms of victimization and symptom levels (Glossary; Hodges et al., 2013; Martin, Cromer, DePrince, & Freyd, 2013; Turner, Finkelhor, & Ormrod, 2010). A number of researchers include four or more traumas in poly-victimized groups; for others the cut-off has been seven. Finkelhor et al. (2014) found that while older children were likely to have more victimizations, children at higher levels of victimization in each age group were much more likely to have higher levels of other types of adversities (e.g., illnesses, family problems, accidents) and to be distressed (nationally representative sample, N = 4046 ages 0–17). They set thresholds for poly-victims at five or more for ages 2–5; at six or more for ages 6–9; seven or more for 10–13; and eight or more for ages 14–17 (Table 15.1). Some researchers suggest that certain traumas (e.g., sexual

abuse) be weighted more heavily than others, whereas others suggest a more individualized approach to exposure and vulnerability (see Ford, Charak, Modrowski, & Kerig, 2018a). Multiple methods of identification have found poly-victims, each group with unique profiles (Ford & Delker, 2018; Table 15.1).

For adults with cumulative traumas before age 18, researchers have observed a significant linear relationship between number of childhood trauma types and number of symptom-cluster types (symptom complexity) reported simultaneously in adulthood (Briere, Kaltman, & Green, 2008; Briere et al., 2016; Cloitre et al., 2009). A history of more than one type of childhood trauma is related to increased likelihood of a number of disorders, including psychosis in adulthood (Alvarez et al., 2015; Shevlin, Dorahy, & Adamson, 2007). Additional victimizations are common for aggressive traumas (Finkelhor et al., 2007; see Nader & Fletcher, 2014). Pathways to revictimization may involve failure to recognize risky situations or betrayal or involve dissociation (see Nader & Fletcher, 2014). Strom et al. (2018) found that half of adults who had experienced other severe violence in childhood were also bullied as youth. Subsequent victimizations may not match the original form of victimization. For example, Hébert and colleagues (2016) found that many child sexual assault victims were also victimized by their peers at school—60% reported being picked on, 51% reported verbal victimization, and 35%, physical victimization. Peer victimization has increased the likelihood of dissociation and PTSD symptoms up to three-fold.

Cumulative traumatization has been related to pathological dissociation (N = 89; Chiu et al., 2015). While childhood (not adulthood) traumas were important to the development of non-taxon dissociation, adulthood trauma exacerbated the effects of childhood nonspecific dissociation on the emergence of pathological dissociation. De Bellis, Woolley, and Hooper (2013) found that maltreated youth with PTSD experienced more maltreatment types as well as greater physical abuse severity, PTSD and dissociative symptoms, and greater internalizing and total behavior problems. They had lower levels of functioning (general; lower academic achievement) compared with maltreated youth without PTSD. Finkelhor et al. (2007) suggest more than one possible mechanism by which poly-victimization leads to more severe and less reversible outcomes—e.g., multiple stressor exposures may lead to more people, places, and things that serve as traumatic reminders, interfering with coping; self-blame may be more likely after more than one exposure. Cumulative traumas have been related to the intensity of dissociative symptomatology—patients without multiple traumas had an average Dissociative Experiences Scale (DES) score of 6.64; healthy controls, DES average = 7.43; and poly-traumatized individuals (with four or more types of trauma), DES average = 27.27 (Alvarez et al., 2015).

Trauma's Effects on Neurobiology and Development

The body's stress response system mobilizes reactions to danger and may be affected by trauma or adversity (see Nader, 2008; Stein & Kendall, 2004). The Hypothalamic-Pituitary-Adrenal (HPA) and other brain regions may be altered by stress. Stressors also may affect the range of developmental domains.

The Stress Response System

Limbic and cortical regions relay information about threats that can activate or terminate stress response systems—e.g., detect, integrate, and/or respond to threat (e.g., amygdala, hippocampus, prefrontal cortex; Hostinar & Gunnar, 2013; Luyten & Fonagy, in press; Table A4.2). Early parental support corresponds to amygdala-dependent emotional circuitry that can appropriately differentiate threatening from nonthreatening stimuli (Hostinar & Gunnar, 2013). In contrast, when biological risk factors combine with trauma (e.g., child abuse), altered amygdala development may be perpetually primed for stress responsiveness. Excessive or age-inappropriate stress—possibly combined with stress

sensitivity—may trigger a developmental cascade with increasing impairments in reward sensitivity, autonomy, agency, capacity for mentalizing (Glossary) and/or social cognition—all relevant to the emergence of internalizing disorders, which additionally interfere with development (Luyten & Fonagy, in press). Trauma combined with genetic factors (e.g., FKBP5 variants) can lead to long-term changes in skills, such as stress regulation (Kohrt et al., 2015).

Childhood traumas have affected multiple areas of brain and nervous system development (e.g., Botterill et al., 2014; hippocampus, Carrion et al., 2010a; may cause kindling, Glossary, Dackis et al., 2012; HPA axis, autonomic system), including areas critically involved in inhibiting the stress response (e.g., Carrion et al., 2007). Brain regions such as the HPA axis, the sympathetic nervous system (SNS), and the serotonin system are negatively affected by trauma (Kavanaugh & Holler, 2014; Chapter 14). Under normal circumstances, through several feedback control loops influencing regulatory centers in the brain, the HPA axis constantly attempts to maintain the day-to-day exposure of tissues to normal cortisol levels. Childhood trauma has altered stress reactivity by altering HPA axis functioning—e.g., has interfered with a feedback loop that inhibits activation (Gillespie, Phifer, Bradley, & Ressler, 2009; Roy et al., 2010). While the HPA axis also has positive effects on functioning—e.g., supports positive mood; prepares the body for coping with threat/stress—it is responsive to many stressors, and its products have widespread effects that influence neurodevelopment, behavior, and health (see Koss & Gunnar, 2018). For humans, the stress hormone, cortisol, is the predominant glucocorticoid of interest (Glossary). Long-term or severe exposure to cortisol can have damaging effects on the body. Insufficient serotonin, a hormone important to mood and emotion regulation, may result in over-activation of the HPA system and release of increased cortisol. Prolonged activation may lead to over-activation or under-activation (hyper- or hypo-cortisolism; McCleery & Harvey, 2004). Either hypo- or hyper-cortisolism may lead to altered brain function, to mental health problems, and/or to disease (Alexander et al., 2018; Carpenter et al., 2009; McEwen & Wingfield, 2010; Weems & Carrion, 2009). Individuals with traumatic or chronic stress may initially show frequent and prolonged cortisol elevations, then low or blunted cortisol levels that may co-occur with the hyper-responsivity of other stress systems (Koss & Gunnar, 2018). Blunted cortisol has been linked to a number of problems—e.g., suicidality, lower memory function (with lower income), mood disorders, conduct problems, and aggression (Bernard et al., 2015a; O'Connor et al., 2018; Raffington, Prindle, Keresztes, & Shing, 2018).

Chronic hyperactivity of HPA axis and consequent long-term exposure to stress hormones (e.g., cortisol) also can result in neuronal loss in a brain region that directs learning and memory (hippocampus; Cicchetti, 2003; see Nader, 2008; Sapolsky, 1998, 2000; Stein & Kendall, 2004), along with inhibited neuronal regrowth (neurogenesis), impairments to other brain processes, and cognitive and affective functional impairment. Suicide victims with a history of maltreatment have had greater decreases in the hippocampal mechanisms that inhibit HPA axis activity than individuals with sudden accidental death and no abuse (McGowan et al., 2009). Chronic stress early in development has led to long-term dysfunction in the mesolimbic dopaminergic pathway, contributing to depressive-like behavior—e.g., reductions in motivation to obtain rewards, social motivation, and acquisition and expression of Pavlovian appetitive conditioning (Auerbach, Admon, & Pizzagalli, 2014).

Other Brain Effects

During periods of brain maturation, stress and elevated levels of stress hormones and neurotransmitters may lead to adverse brain development through delays in myelination, apoptosis (programmed cell death), abnormalities in developmentally appropriate pruning, the inhibition of neurogenesis, or other stress-induced decreases in brain growth factors (see De Bellis & Zisk, 2014). Trauma may affect multiple brain regions and their connectivity. Brain changes have been evident

with or without overt psychopathology. Such changes can predict future symptomatology (McCrory, Gerin, & Viding, 2017)—e.g., altered threat responsiveness, changed reward processing, increased effort to self-regulate. For example, across maltreatment studies, threat processing studies have shown heightened or depressed neural responsiveness in maltreated youth (especially in the amygdala), likely reflecting threat hypervigilance and avoidance respectively (McCrory et al., 2017). Reward processing influences goal-directed behavior. Studies of reward processing usually reported blunted neural response in anticipation and receipt of rewards (especially in striatum), which has been associated with depressive symptomatology. Emotion regulation studies have reported increased activation of the anterior cingulate cortex (ACC) during active emotion regulation, which may reflect greater effortful processing (Table A4.2). Atypical connectivity and focal activity in fronto-limbic neural circuits and in ventral ACC and amygdala may reflect increased allocation of cognitive resources in order to effortfully modulate emotional responses (McLaughlin et al., 2015c)—e.g., increased dorsal ACC activity during error monitoring and inhibition (related to attentional control; executive control; McCrory et al., 2017). Hence traumas may result in the necessity of having to expend more effort to process emotions and to self-regulate.

Language Development and Trauma

Language development may be undermined, e.g., by premature birth, poor hearing, neglect, low verbal interaction, punishment for attempts to speak, or other abuse (Becker-Weidman, 2009; Charollais, 2014; Manso, Garcia-Baamonde, & Alonso, 2011). Early traumas may delay or alter language development with ongoing repercussions (e.g., related to sensory modulation dysfunction, Glossary; Atchison, 2007). Loss of a parent also may interrupt language development, especially if the parent was the one who best understood what the child was trying to say (Atchison, 2007). Loss of one's best interpreter can be difficult at any age.

In 2000, for general disability, typically developing children had a maltreatment prevalence rate of 9%, whereas children with a range of disabilities had a maltreatment prevalence rate of 31% (3.4 times more likely to be maltreated; Sullivan & Knutson, 2000). Disabled children were more likely to be maltreated at younger ages. Children with speech and language impairments had essentially five times the risk for physical abuse or neglect, three times the risk for sexual abuse, and seven times for emotional maltreatment. Maltreated children have shown poorer skills in expressive language, receptive vocabulary, and language (see Byrne, Lyddiard, & Furniss, 2017). Exposure to violence—witnessed or experienced—or to neglect has been related to language delays. Children exposed to mothers' intimate partner violence have scored significantly lower on verbal ability than same-age children in a national sample (N = 1787 preschoolers, Graham-Bermann et al., 2010). Maltreated children placed in out-of-home care and severely neglected children have had language delays, even if the severe neglect began before nine months of age (Byrne et al., 2017; Sylvestre & Merette, 2010). Although an accumulation of biological and psychological risk factors appeared to have a "pile-up" effect on language development, the effects of neglect on cognitive development had a stronger influence on language delays than total risk factors (N = 68, ages 2–36 months, Sylvestre & Merette, 2010). Mothers' own abuse/neglect experience or mother not finding the child pleasing also were related to language delays (Sylvestre & Merette, 2010). By school age, abused youth have had more severe language delays (Atchison, 2007). For neglected children, exposure to early intervention programs that promote increased quantity and quality of language stimulation for the child have improved outcomes (Sylvestre & Merette, 2010)—e.g., engaging in social, play, and communication interactions with foster siblings (Byrne et al., 2017). Child Welfare supervised children placed in early care and education programs—e.g., Head Start, preschool—have shown better language skills than those not enrolled (N = 1652; Merritt & Klein, 2015). It is important to recognize the other effects of trauma on children when addressing language delays—e.g., effects on the child's

individual identity formation, sensory systems—e.g., noise sensitivity, neurological development, executive functions such as memory and attention, socials skills, and ability to make and maintain relationships (Byrne et al., 2017).

The Dialogical Self and Trauma

Patterns of internal dialogue are influenced, from childhood onward, by caregiver–child and other relationships and by impactful experiences such as traumas or successes (Chapters 1, 4). From a multiple-self perspective, psychopathology has been associated with lower levels of self-complexity—i.e., use/awareness of fewer internal voices, low complexity and excessive rigidity (e.g., personality disorders, PD); dominance of negative internal voices (e.g., depression); inability to organize aspects of self or organization involves low complexity of self-aspects (e.g., schizophrenia); disorganization of internal voices or lack of an observer-self—e.g., express one unrelated self-facet after another, unpredictably and without reference to the other facets (narrative disorganization, e.g., can happen in schizophrenia, BPD, dissociative disorder); and/or difficulty recognizing personal thoughts and affects and the antecedents to affects (e.g., complicated trauma, personality disorders) (Bateman & Fonagy, 2004; Dimaggio et al., 2006, 2010). Reduced ability to use a range of internal voices has been observed in traumatized individuals. One defining impact of a trauma is that it can install a "traumatic self" as the nucleus around which a person's self-narrative develops, consequently elaborating subsequent life experiences that are emotionally congruent with that traumatic self-narrative (Neimeyer, Herrero, & Botella, 2006; see victim coping or mythology, Ford, 2002; Tinnen, Bills, & Gantt, 2002). Regardless of treatment method, individuals with psychopathology have improved—e.g., in emotional state, responses from others—when they were less dominated by a single voice/pattern; were able to generate representations of self and of others more flexibly—e.g., had better recognition of personal and others' wishes, feelings, and behavior; had increased access to formerly suppressed voices; had increased self-reflection (RF) or mentalizing skills—i.e., seeing self from the outside, seeing others from the inside (Fuggle et al., 2015); and had better ability to assimilate problematic internal voices into a broader self-narrative (Dimaggio et al., 2010).

Executive Functions

Both traumas (e.g., emotional and physical neglect) and stressors (e.g., with parents, in school) have been associated with poorer general intelligence and at least one impairment in cognitive functions—e.g., intelligence, problem-solving, cognitive flexibility, decision-making, emotion attributions (Fishbein et al., 2009). Poverty often includes chronic stressors such as noise, household chaos, and conflict among family members, and it has been related to brain changes and to stress sensitivity (Blair & Raver, 2016). Poverty has been linked to reduced brain gray matter in regions related to EFs, academic achievement, school readiness (e.g., frontal and temporal cortex), and elevated cortisol (infancy-age 22; see Blair & Raver, 2016). With or without PTSD, stressors are associated with decrements in general intelligence and problems with higher-order neurocognitive functions (see Fishbein et al., 2009). For children assessed from birth through age nine, early childhood maltreatment was associated with lower age three cognitive skills and more behavior problems and was modestly linked between ages three and nine with children's poorer cognitive skills and greater behavior problem trajectories (ages 3–9; Font & Berger, 2015). As will be noted in age-related chapters, caregivers, child-focused educational support, and high-quality early education have been important to recovery from EF deficits and to children's stress-related physiologic reactivity, cognitive control, and self-regulation (Blair, 2017).

Altered Attentional Focus and Information Processing

Attachment style/history, traits (e.g., genetic, personality), and experience (e.g., intense or traumatic) may change attention and processing by interrupting attention to some things, increasing attention to other things, and altering the way that incoming information is processed. Children with insecure-resistant attachments have shown preoccupations with caretaking relationships and sometimes have held attention away from mainstream peers or lessons (Tables A3.2–3.4; Box 10.2; Chapter 4). Attentional problems have been linked to cognitive problems and to developmental and psychological disorders—e.g., ODD, ADHD, depression, anxiety (Giordano et al., 2017). Attention problems have had problematic effects on other EFs. Selective attention can constrain working memory and inhibition processes (Kane & Engle, 2003; Rose et al., 2012a). In addition, posttrauma neurobiology can impair the brain's ability for flexible thinking (including the shifting of attention) and for learning and reasoning (Nader, 2008; Neimeyer et al., 2006; Siegel, 1999).

Information processing may be significantly and dynamically influenced by traumatic experiences (or by other intense experiences; see Nader, 2008—Chapter 14). Traumas may result in script-like behaviors (Chapter 3) and/or in changes in attentional focus such as selective attention to trauma-related stimuli and emotions, along with negative expectations, which influence behaviors (Box 2.1; Herman, 1997; Nader, 2008; Goodman, Harnett, & Knight, 2018; adults, Bardeen & Read, 2010). For example, youth with multiple exposures in violent communities may develop a "kill or be killed" attitude that increases focus on the potential for another to retaliate and results in anticipatory violent aggression (Garbarino, 1999). On the other hand, youth who show fear in violent communities may invite victimization (Bruyere & Garbarino, 2012; Garbarino, 1999). Children may exhibit rigidly controlled behavior patterns such as compulsive compliance, inflexible rituals, and/or rigidly controlled eating patterns (Finn, Warner, Price, & Spinazzola, 2017).

Some attention or attributional biases may increase both positive and negative behaviors. Bondü (2018) points out that individuals who are altruistically sensitive to injustices toward others or who have a hostile attribution bias have been shown to have selective attention to cues of untrustworthiness and may withdraw cooperation after only slight cues of untrustworthiness. Hostile attribution biases (HAB) have been associated with trauma and have been linked to aggressive behaviors (Helfritz-Sinville & Stanford, 2014; Chapters 3, 15). Across 27 studies, for both genders, HAB was more strongly and consistently related to reactive than to proactive aggression (age range: 7–18; perhaps more strongly for youth who have been victimized; Martinelli et al., 2018). While maltreatment (e.g., neglect) has been related to misattribution of emotions to others (Fishbein et al., 2009), grief has been related to altered attention to facial emotions. For adults with complicated grief, 1.5–3 years after the death, Bullock and Bonanno (2013) found an attention bias away from happy faces in neutral conditions and away from closed-mouth sad faces when primed with the deceased's name.

Memory and Trauma

Young children normally recall memories in general categories and increase in recalling specific memory episodes with age (Burnside et al., 2004). Multiple variables may affect memory—e.g., attachment issues; stress levels; sleep; trauma (e.g., Steenari et al., 2003). While moderate stress levels may assist memory—e.g., strengthen plasticity of the hippocampus (responsible for cold memory; Ruf & Schauer, 2012), traumatic experiences can disrupt many cognitive functions—e.g., memory, concentration, imagination, clarity of thinking, information processing, resulting in delayed or faulty processing of information, poor memory processes, and difficulty reading others' emotions or intent (see Nader, 2008 for a summary). Stress hormones such as adrenalin and glucocorticoids enhance memory, while opioids and GABA or benzodiazepine receptor agonists impair memory (Glossary; McCleery & Harvey, 2004). After traumas, memory may become enhanced for

and repeatedly drawn to aspects of the traumatic experience and may be disrupted for other functions (Nader, 2008; Boxes 2.1, 2.2a). Enhanced memory of emotionally arousing stimuli has been well documented (e.g., McCleery & Harvey, 2004)—trauma details may become "etched-in" and long-lasting memories (Koss et al., 1996; Nader, 1997; Pynoos & Eth, 1985; Terr, 1979, 1991). Such memories may replay repeatedly or in response to trauma reminders.

On the other hand, severe or prolonged stress can interfere with memory mechanisms (Bremner, 2003, 2006; Gould et al., 2012; Sapolsky, 1998; Savitz et al., 2007). Severe or repeated traumas may injure or reduce volume in brain regions related to memory (e.g., hippocampus) or other cognitive functions (e.g., prefrontal cortex [PFC]; Bunge & Wright, 2007; Table A4.2). PTSD patients have reported problems with declarative memory (e.g., remembering facts or lists), memory fragmentation, dissociative amnesia (memory gaps), memory problems related to poor concentration (Bremner, 2011), and/or dissociative tendencies (linked to lapses of memory, compromised emotional memory, Oates & Ray, 2008). Greater degrees of brain atrophy (not minimal) have been linked to explicit memory deficits; severe atrophy has predicted severe dissociative symptoms (Bremner, 2003; Sapolsky, 2000; Tables 1.1, A4.2). Aspects of an event may be unavailable to conscious memory (e.g., amnesias).

In the general population, higher levels of children's perceived communication with mothers has been related to increased memory specificity (N = 80; ages 10–13; Bosmans, Dujardin, Raes, & Braet, 2012). Additionally, higher levels of trust in maternal support related to higher self-reported communication about experiences with mothers, which in turn was linked to enhanced retrieval of specific autobiographical memories. Hence, by talking about memories with children, mothers assist youth to have recollection of specific memories. Over-general memory (OGM; Glossary)—nonspecific, autobiographical memory—has been found in relationship to depression, PTSD, impaired problem-solving, and unhealthy repetitive thinking (Bosmans et al., 2012). For children exposed to significant stressors in early and middle childhood, OGM retrieval may initially serve as a protective mechanism that later becomes a risk factor for depression or anxiety (Brennen et al., 2010). Since specific memories may be used as a frame for problem-solving or decision-making, the lack of specific memory retrieval may interfere with those processes (van Daele et al., 2014). Although both depressive symptoms and abuse have been related to OGM, abuse has been related to OGM with low or high depressive symptoms (Valentino, Bridgett, Hayden, & Nuttall, 2012). Distancing coping used by individuals traumatized as children (e.g., sexual abuse) has predicted over-general memory in adolescence and adulthood (Harris et al., 2015a). Individuals with PTSD also have had more difficulty retrieving and disclosing positive events/memories than others (Bedard-Gilligan, Jaeger, Echiverri-Cohen, & Zoellner, 2012; Moore & Zoellner, 2007; Box 2.2b).

Trauma and Inhibition

Although inhibition is essentially the ability to suppress a dominant, automatic or pre-potent response, it also includes attentional, behavioral, thought, and/or emotional control to override a strong internal predisposition or an external lure (Best, Miller, & Jones, 2009; Roskam, Stievenart, Meunier, & Noel, 2014; Chapter 1; Glossary). Trauma has been related to poorer performance on EF skills, including on inhibition tasks, even after controlling for variables such as SES and anxiety (e.g., DePrince, Weinzierl, & Combs, 2009). Deficits in such skills influence other skill development.

Brain regions related to inhibitory control have been affected by traumas. Reduced activation in the rostral anterior cingulate cortex (rACC) has previously been associated with PTSD, anxiety disorders, and fear-inhibition deficits (Stevens et al., 2016). Childhood maltreatment was related to lower inhibition-related activity in rACC and long-lasting reduction in inhibitory PFC activation in individuals with PTSD (not for those without PTSD; Stevens et al., 2016). Decreased rACC

activation was linked to more severe depressive symptoms as well. Increased activation in the rACC has been associated with treatment success and spontaneous recovery from PTSD. When individuals with PTSD demonstrate exaggerated fear responses to trauma-related stimuli with difficulties inhibiting fear even in safe environments, it has been described as reduced fear-inhibition and decreased contextual cue processing (e.g., do not recognize safe contexts). Although a similar study was not found for youth, combat PTSD patients have shown behavioral and neural deficits in inhibition and contextual cue processing (van Rooij et al., 2015). For example, they failed to deactivate the motor cortex during response-inhibition, and they showed decreased cue processing combined with decreased activation of brain regions important to regulating attention (right inferior frontal gyrus). Inhibition and cue processing deficits were unaffected by treatment and may represent either vulnerability factors or the scars of PTSD. In contrast, increased activation of regions important to contextual cue processing (left inferior parietal lobe [IPL]) at baseline and reduced activation of IPL posttreatment predicted percentage of symptom improvement. This suggests that contextual cue processing may facilitate the effects of psychotherapy.

Trauma and Humor

Of course, it isn't reasonable to try to force or cajole a child to use or respond positively to humor. "Getting a joke" requires flexible thinking and at least normal processing speed and attention (Campbell et al., 2015; Vaid et al., 2003), and trauma can interfere with both. In fact, for depressed individuals, the brain regions used in processing humor show decreased activity (Edwards, 2010). After traumas, some children will enjoy humor or use humor to relieve tension, and others will either miss the point of attempted humor or will find humor distressing or annoying. The return of a sense of humor may be a sign of progress in recovery, for some children. Others may be able to move between periods with an ability to respond to or use humor and periods of disability. Humor can become a part of treatment when a person is ready for it. Humor has been used as a part of therapy and for rapport building (Fox, 2016; Kerig & Alexander, 2012; Lanktree & Briere, 2008; Chapter 16). Specific types of humor therapy have been used to improve the well-being of adults with specific problems (e.g., depression, Proyer, Gander, Wellenzohn, & Ruch, 2014). Overuse of humor as a method of avoidance or avoidant coping may interfere with recovery or prolong posttrauma reactions (e.g., grief, Boelen, van den Hout, & van den Bout, 2006; PTSD, Cloitre et al., 2012; grief, Nader & Salloum, 2011; Chapter 13).

Trauma and Social Skills

Traumatic experiences can interfere with interpersonal functioning. For a variety of traumas, children may strain or lose their friendships and/or social status because of changes in temperament, behaviors, and deficient use of social skills (Nader, 2008; Box 3.1). For example, posttrauma irritability, fearfulness, impairments in emotional awareness, or other posttrauma distress can interfere with interpersonal relating and may affect reactions from others. Following traumas, for some severely traumatized children, symptoms such as noise intolerance or distress in the presence of other children or loss of self-confidence have contributed to reductions in popularity (Chapter 3—Cascading Effects).

Social competence has been reduced in children in out-of-home placement. Maltreated foster care (FC) children have performed lower than normal children on social and academic competence (Pears et al., 2010). Children raised in institutional care (IC) have exhibited unusual social behaviors (e.g., RAD, DSED, Zeanah, Smyke, Koga, & Carlson, 2005; Chapter 5) and have demonstrated greater speech reticence and lower social engagement—e.g., lower confidence in

initiating and maintaining social interactions with unfamiliar peers—than FC children (in middle childhood, Almas et al., 2015; Chapter 5). IC children's greater reticence in a speech task (not FC intervention children's) elicited lower social engagement from other children. Although some intervention results for IC children have shown timing effects, social behaviors were not influenced by age of placement (in foster care). Children in the FC intervention program showed less social reticence.

PTSD has altered brain function in a way that alters social processing. A significant number of adult PTSD patients with childhood traumas have shown profound interpersonal dysfunction—e.g., within the family, with friends, with romantic partners (see Lanius et al., 2014). Empathy and perspective-taking are important to inter-relating. Some studies have found deficits in face-emotion recognition and in theory of mind processes for PTSD patients, including less accurate judgment of complex mental states (Lanius et al., 2014; Table 1.2). Increasing reflective functioning/theory of mind skills may be important for youth with PTSD and their parents.

For healthy individuals in *Western* countries (some Asian cultures consider direct eye contact to be rude/inappropriate), eye contact initially leads to activation of a fast, subcortical pathway that then modulates a cortical route eliciting social-cognitive processes (Steuwe et al., 2014). That is, they respond with a reflective, cognitive route of direct gaze processing that serves to mentalize (think about own and others' mental states; Table 1.2) and evaluate the ongoing social interaction. Direct rather than averted gaze evokes higher-level social cognition. In a study using angry, happy, and neutral virtual characters, healthy adult Canadians (N = 16) reacted to prolonged direct gaze exposure with cortical activation that enhances evaluative processes underlying social interactions. In contrast, PTSD patients (N = 16) with a history of prolonged child abuse did not respond with the typical rapid brain activation involved in social cognition. They reacted to prolonged direct gaze with sustained activation of a subcortical route of eye contact processing that is related to more general face processing that has sometimes been described as an innate alarm system (regardless of emotion content; Steuwe et al., 2014). This system may serve to detect potential threat. The region activated has been shown to elicit defensive behaviors—e.g., exaggerated startle, hypervigilance, cowering, and escape reactions. Steuwe and colleagues suggest that instead of higher-level social cognitions, the response in PTSD patients may be linked to a state of *primary process consciousness* or a *lower-level* state of consciousness, based on basic neural representations of pain, fear, anger, separation distress, sexual, and maternal behavior. Larger studies are needed.

Box 2.3 Play Room

Sixteen abandoned Romanian children were examined for their play behaviors in a therapeutic intervention (Brown, 2014b). The children (ages 1–10) were restrained to a cot, lacked normal social interactions, lacked attachments, did not play, and had suffered chronic abuse and neglect. There was an absence of crying, laughing, yelling, or other normal sounds. Children functioned below chronological ages (e.g., 4–7 years younger). The children generally had flat affect and exhibited seemingly irrational fears that resulted in frantic rocking and sometimes head-banging.

Children were introduced to a play room, and initially played or sat alone. Over time, their social interactions became more complex. They caught up to age-normal physical size and some developed meaningful engagement. The Playworkers followed the children's lead, honoring Axline's belief that, with enough time and space, children find a solution to problems in their play. All children made progress, and some made rapid progress (see Brown, 2014b for examples and details).

Trauma and Play

Trauma may interrupt the ability to play normally as well as the ability to use play for skill development or for stress reduction. Under-stimulating environments—e.g., institutionalization or other neglect—may not encourage communication, exploration, or use of imagination with toys (Byrne et al., 2017; Box 2.3). Neglected children have exhibited poor play skills—e.g., showed inability to manipulate age-appropriate toys (Byrne et al., 2017). Sexually abused children have had significantly more difficulties developing and concluding play narratives and have had significantly lower reflective functioning (RF, Glossary; Tessier et al., 2016; TOM deficits re: self and others, Ensink et al., 2014). A young child's ability to create meaningful and coherent play sequences after sexual abuse has been associated with the development of better RF (Tessier et al., 2016). Their capacities to elaborate and conclude play narratives predicted later TOM abilities regarding others (but not for themselves). Hence, restoring the ability to create and complete play narratives may be an important aspect of therapeutic play.

Traumatized youth may be compelled to enact traumatic experiences in play or activities (Gaensbauer, 2002; Nader & Pynoos, 1991; Chapter 7). As a form of reenactment or other re-experiencing, traumatic play may represent attempts to process aspects of the trauma (Nader, 2008). However, traumatized youth may be unable to process experiences through play without assistance or a therapeutic presence (Nader & Pynoos, 1991; Terr, 1981; Webb, 2015; Chapter 13). For children exposed to terrorism, PT play was associated with higher PTSD levels (Cohen, Chazan, Lerner, & Maimon, 2010; Chapter 8). When it included mainly negative affects, frequent morbid themes, a lowered developmental level, and reduced awareness of self as a player, it significantly predicted more PTSD symptoms. Play or other posttrauma methods in the presence of a therapist, with a benign interest in a child's internal world, may restore access to important inner resources (Box 2.3).

The Impact of Trauma on Self-Skills

Self-regulation and self- and other-awareness skills are essential to functioning. For young children, traumas may undermine the scaffolding of specific skills (the effectiveness of parental just-enough-assistance e.g., to self-awareness, perspective-taking, Glossary, Chapter 5). It may undermine developing skills. The symptom complexity of proposed Developmental Trauma Disorder (DTD) or complicated childhood trauma has been described as failures in self-regulation—behavioral, emotional, and interpersonal regulation (Ford, 2011; see Symptom Complexity, later in this chapter).

Disruption of Self-Regulation

Trauma and attachment insecurity each are among variables associated with emotion and behavioral regulation difficulties and maladaptive responses to stress (Mikulincer & Shaver, 2007, 2008). Both for resilient and for susceptible individuals, traumas may disrupt self-regulation in a number of ways (e.g., maltreatment, Teicher & Samson, 2016). Extreme stress may disrupt the functioning of brain regions (particularly prefrontal cortex) and thus undermine executive functions—e.g., self-regulation, attention, organization, planning, and inhibition of the stress response (Nader & Fletcher, 2014; Rothbart & Rueda, 2005; Stevens, Kiehl, Pearlson, & Calhoun, 2007; Teicher & Samson, 2016). Trauma may disturb regulation-related beliefs. For example, after a tornado (10 children died), some elementary school children were heard to ask why they should bother to be good, if you can die anyway (Nader, 2008). Posttrauma agitation, fear, or other arousal symptoms also may make it difficult to control reactions. Deficits or problems in self-regulation are associated with the development of many forms of maladaptation or psychopathology—e.g., conduct disorder, ADHD, OCD; depression; borderline PD; PTSD; deliberate self-harm;