Like adults, children vary in their typical behaviors, emotions, and thinking. Children’s behavioral differences emerge in the first months of life, and those differences become more pronounced and complex as children move through the toddler, preschool, school-age, and adolescent years. In different research contexts, the individual differences that are consistent across time and situations are known as either temperament traits or personality traits. Parents, educators, physicians, mental health workers, and policy makers all ask important questions about these early emerging differences in children: What are the most important individual differences that can be observed in youth? To what extent do children’s personalities change and through what processes? Do the family environment and the broader context make a difference in the formation of children’s personalities? During the past several decades, research on early temperament and personality development has begun to yield answers to these questions. The research addressing these questions has been aided by a growing consensus about what the most important temperament and personality traits are in childhood and adolescence.

CONCEIVING OF TEMPERAMENT AND PERSONALITY TRAITS IN YOUTH

Before reviewing contemporary research on temperament and personality development, it is important to address the question of how these two domains of traits relate to each other conceptually because this is such a widely debated issue. Most researchers who investigate adult traits describe them as personality rather than temperament, although there are some notable exceptions in which adult traits are labeled as temperament (e.g., Cloninger, Svrakic, & Przybeck, 1993; Evans & Rothbart, 2007; Strelau, 1987). In contrast, most research on children’s traits focuses on temperament, rather than personality, although the volume of work specifically focused on personality traits in youth has increased considerably over the past 20 years.
What Are Temperament Traits?
A quarter century ago, a now-classic paper—“What is Temperament? Four Approaches”—brought together important temperament theorists, including Thomas and Chess, Rothbart, Buss and Plomin, and Goldsmith, to debate questions about the nature of temperament (Goldsmith et al., 1987). This paper proposed a consensus definition of temperament:

Temperament consists of relatively consistent, basic dispositions inherent in the person that underlie and modulate the expression of activity, reactivity, emotionality, and sociability. Major elements of temperament are present early in life, and those elements are likely to be strongly influenced by biological factors. As development proceeds, the expression of temperament increasingly becomes more influenced by experience and context. (p. 524)

This basic shared understanding of temperament guided research on temperament for many years. New findings and approaches, however, have offered alternative perspectives on these guiding assumptions. First, not all temperament traits are stable early in life, perhaps because new temperamental systems that control or inhibit the more reactive aspects of temperament emerge only later in infancy; as these control systems come online, they may change the expression and stability of the more reactive traits (Rothbart, 2011). As reviewed later in this chapter, temperament traits become more consistent with age, showing substantial stability by at least the preschool years (Roberts & DelVecchio, 2000). Second, most temperament researchers would add other traits to the list enumerated in the definition. As discussed later in this chapter, the traits of activity level, positive emotionality (which includes sociability), and negative emotionality all continue to be considered major aspects of temperament. This list, however, leaves out dimensions of attention and self-regulation, which have turned out to be important individual differences that emerge in basic form in infancy, derive in part from developing biological systems, and modulate the development of more reactive emotional systems (Rothbart, Sheese, & Posner, 2007; Rueda, 2012). Newer research has documented that affective and cognitive processing are highly integrated systems (Derryberry & Tucker, 2006; Forgas, 2008) and, therefore, that some aspects of temperament—such as attention and executive control—involves individual differences in domains traditionally considered more cognitive in nature.

Third, the field’s understanding of the joint workings of biological factors and experience in development has become more complex. The Goldsmith et al. (1987) definition has argued that temperamental differences are influenced strongly by biology at the start but become more influenced by environmental experiences with time. This dichotomy between biological and environmental influences is not consistent with current perspectives on brain and behavioral development. Before a child’s birth, the intrauterine environment already has influenced the expression of each child’s genetic material (Feldman, 2008; Huizink, 2012). Experiences continue to shape gene expression after birth (Champagne & Mashoodh, 2009) and play a crucial role in shaping brain architecture in childhood (S. E. Fox, Levitt, & Nelson, 2010). Both genetic and environmental factors influence temperament from infancy onward, and new genetic influences on temperamental traits arise later in development (Saudino & Wang, 2012). In short, it no longer makes sense to argue that traits may be more biologically influenced early in life and more environmentally influenced later in life; brain development and behavioral development are completely interdependent across time (Stiles, 2009).

The newest work on temperament suggests an alternative definition: Temperament traits are early-emerging basic dispositions in the domains of activity, affectivity, attention, and self-regulation, and these dispositions are the product of complex interactions among genetic, biological, and environmental factors across time (Shiner et al., 2012).

Personality Traits in Childhood and Adolescence: How Do These Relate to Other Personality Differences and to Temperament?
Researchers and laypeople alike generally view personality as including a much broader range of
individual differences than temperament. McAdams and colleagues have developed a three-part taxonomy for describing the full range of personality differences (McAdams & Olson, 2010; McAdams & Pals, 2006), and this taxonomy may be applied to individual differences in children and adolescents as well as adults (Shiner, 2010; Shiner & Caspi, 2012).

First, the dispositional signature includes the genetically influenced traits that people express in their behaviors, thoughts, and emotions with some consistency across situations and over time. The dispositional signature includes the traits in the Big Five or Five-Factor Model (John, Naumann, & Soto, 2008), which is discussed in more detail in the next section of this chapter, along with other stable and consistent tendencies.

Second, characteristic adaptations include “a wide range of motivational, social-cognitive, and developmental adaptations” that are specific to a particular time, place, or role (McAdams & Pals, 2006, p. 208). Unlike traits, which typically show some consistency across situations and time, characteristic adaptations often vary more across different life contexts. Some characteristic adaptations emerge very early in life; for example, even very young children show individual differences in their mental representations of the people and world around them (Dweck & London, 2004). But, with increasing cognitive capacities in the school-age years, children display an even wider range of characteristic adaptations. Children vary, for example, in their goals for academic and occupational attainment (Massey, Gebhardt, & Garnefski, 2008), values (Daniel et al., 2012), coping styles (Skinner & Zimmer-Gembeck, 2007), and a wide variety of other mental representations and strategies (Pomerantz & Thompson, 2008; Shiner & Caspi, 2012).

Third, people show individual differences in their personal narratives, stories about their lives that help them to make sense out of their identities over time. Narratives share common features across individuals, but they also differ across people in coherence, complexity, growth, meaning, themes, motives, and content (McAdams, 2008). During childhood, youth begin to acquire and hone the skills necessary for creating life narratives (Bohn & Berntsen, 2008; Fivush, Sales, & Bohanek, 2008), but narratives do not become an important aspect of individuals’ personality profiles until later in adolescence (McAdams & Olson, 2010; Pasupathi & Wainryb, 2010). Although traits shape the development of characteristic adaptations and narratives because of their profound effect on how individuals experience the environment (Shiner & Caspi, 2012), it is important to recognize that these other aspects of personality are influenced by many other processes as well, and the links between traits and these other aspects are likely to be relatively weak in magnitude (McAdams & Pals, 2006).

Clearly, temperament traits have the most in common with personality traits in this taxonomy. Both sets of individual differences are conceived of as basic dispositions that are relatively consistent across current situations and across different periods of life, and both are influenced by genetic factors. But how do the two domains of individual differences relate to each other? The answer to this question continues to spark debate. Some developmentalists shy away from using personality traits to describe children’s individual differences because they view such traits as being highly stable and essentially immutable (Sameroff, 2008); they reject the notion of using something so static to describe children. As reviewed later in this chapter, this is something of a caricature of personality traits because, even in adulthood, traits change (Roberts & DelVecchio, 2000). Other researchers accept the claim that youth may display personality traits, but they see these personality traits as being the result of life experiences that have “layered” more cognitive elements onto the more biologically derived early temperament traits. A final model argues that temperament traits and personality traits (like the Big Five) should instead be seen as the same basic set of traits, one manifested early in the life and thus somewhat more limited in scope (temperament) and one manifested a little later in life and broader in scope (personality; Clark & Watson, 2008; McCrae et al., 2000; Rothbart, 2011; Shiner & DeYoung, 2013). From this point of view, personality traits are broader in content than temperament traits simply because biological maturation and expanding experiences permit the expression of new facets of the underlying traits.
This chapter adopts the latter view of temperament and personality traits. This perspective seems the most consistent with the previously described models of the joint role of biology and experience in development. Interacting biological and experiential factors shape the expression of both earlier and later manifestations of traits. In addition, there is no compelling reason to separate the more emotion-focused traits from those that are more related to cognitive processing. Just as biological and environmental factors interact to shape traits, emotion and cognition form an interlocking, dynamic system that shapes behavior across situations (Izard, 2009). Neuroscience research has begun to document how such dynamic systems influence emotional experience (Ochsner et al., 2009). As noted earlier, most temperament researchers recognize that some aspects of temperament are more cognitive in nature—specifically the dimensions of attention, planfulness, and self-regulation that are part of the broader temperament trait called effortful control. The study of temperament has been enriched greatly by the inclusion of effortful control as a basic early trait, and the field could be enhanced further still by encompassing an even broader range of traits. Finally, there is considerable content overlap in the traits measured both early in life and later in childhood and adulthood, a point discussed in more detail in the next section.

TEMPERAMENT AND PERSONALITY STRUCTURE IN CHILDHOOD AND ADOLESCENCE

Although there are similarities in the measurement of temperament and personality traits, the two research traditions also differ in some marked ways, both in terms of the assessment of traits and in terms of how trait structure has been investigated. A trait structure describes which traits covary with other traits at different points in the life course and provides an organizational scheme for the basic units of temperament and personality. The following sections offer, first, a description of the typical measures of temperament and personality traits and the traits derived from those different kinds of measures and, second, a more detailed discussion of the most important traits that emerge consistently across the temperament and personality literatures.

Measuring Traits and Establishing Trait Structure Among Youth: The Temperament and Personality Trait Traditions

Measuring temperament structure. Because young children generally cannot provide self-reports of their own characteristics, temperament research has been characterized by great variety in the measurement of traits; thus, in addition to self- and other-report measures, temperament research often involves the use of behavioral tasks, observational measures, and peer nominations. In behavioral task measures of temperament, children are presented with situations designed to evoke particular behavioral tendencies; children's responses then are coded for specific behavioral indicators (Goldsmith & Gagne, 2012). Laboratory tasks have been created to assess a broad range of traits (e.g., Goldsmith & Rothbart, 1991), along with specific traits such as effortful control (Kochanska & Knaack, 2003), behavioral inhibition (Kagan & Fox, 2006), and exuberance (Degnan et al., 2011). Two recent studies used behavioral task measures to establish trait structure in samples of preschoolers. First, a lab-based study probed the factor structure of children's coded responses to a set of tasks and obtained evidence for five traits: sociability, positive affect or interest, dysphoria (including anger and sadness), fear or inhibition, and constraint versus impulsivity (Dyson, Olino, Durbin, Goldsmith, & Klein, 2012). Second, a home-based behavioral task measure pinpointed a number of distinct temperament traits (Gagne, Van Hulle, Aksan, Essex, & Goldsmith, 2011): anger, sadness, fear, shyness, positive expression, approach, active engagement, persistence, and inhibitory control. These two studies thus obtained evidence for the temperament dimensions of positive affect or approach, negative emotions, and self-control, but the second one demonstrated that these observed traits could be broken into finer grained dimensions (e.g., constraint vs. impulsivity could be split into persistence and inhibitory control). Although used less often than behavioral task
measures, naturalistic observation likewise may be used to assess a broad range of traits (e.g., Bornstein, Gaughan, & Homel, 1986; Buckley, Klein, Durbin, Hayden, & Moerk, 2002). Finally, peer nominations may be used to assess traits that peers may be especially sensitive to, such as shyness or sociability (e.g., Rubin, Coplan, & Bowker, 2009).

Most structural work on temperament has derived from parent-report questionnaire measures instead of behavioral measures, and, indeed, parent reports are the most commonly used measures of temperament across all kinds of studies. Temperament questionnaires generally are developed based on the creator’s particular model of temperament (Mervielde & De Pauw, 2012). Thus, these measures are limited at the outset by the creator’s definition of which behaviors or traits constitute temperament. At present, Rothbart and colleagues’ age-graded temperament questionnaires have been the most influential in establishing the structure of children’s temperament traits, in part because they provide a nuanced look at a broad range of temperament facets assessed across multiple situations (Rothbart, 2011). These measures have been tailored to assess behaviors during different periods of life (e.g., early childhood, preschool and early elementary-school age, middle childhood, early adolescence). In these questionnaires, three overarching temperament trait dimensions capture children’s important individual differences from infancy through early adolescence. Surgency taps children’s tendencies toward sociability, positive emotions, and eagerness to engage in potentially pleasurable activities. Negative emotionality measures children’s general tendencies toward a wide range of negative emotions, including fear, withdrawal, sadness, anger, and frustration. Effortful control reflects children’s emerging behavioral constraint and regulation, including the ability to sustain attention and persist at tasks.

Measuring personality structure. As noted earlier, although most of the research on children’s traits has focused on traits viewed as temperament, a separate line of work has focused instead on a broader range of individual differences that are seen as children’s emerging personalities (Caspi & Shiner, 2006; Mervielde, De Clercq, De Fruyt, & Van Leeuwen, 2005). In research on personality traits in adulthood, the field has converged on a model known variously as the Big Five Model or the Five-Factor Model (John et al., 2008). The traits that make up the model are extraversion, neuroticism, conscientiousness, agreeableness, and openness to experience or intellect. Some of the most compelling evidence for this model for adults comes from lexical studies that examine the structure of large pools of natural language descriptors, based on the premise that the natural language should capture the individual differences seen as most important (Caspi & Shiner, 2006).

Two lines of questionnaire research indicate that the Big Five Model describes the structure of traits in children and adolescents as well as adults (Caspi & Shiner, 2006; Mervielde et al., 2005; Shiner & DeYoung, 2013; Tackett, 2006). First, a number of questionnaires have been created specifically to measure the Big Five in children and adolescents via other report; most of these measures have adapted adult Big Five traits descriptions to make them developmentally appropriate for children (reviewed in Caspi & Shiner, 2006; for especially robust examples of these measures, see Halverson et al., 2003; Mervielde & De Fruyt, 2002). Second, the Big Five structure has been obtained in questionnaires not designed specifically to measure the Big Five but instead created simply to tap a wide range of childhood traits (e.g., Digman & Takemoto-Chock, 1981; Goldberg, 2001; John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994). Parents’ reports on their children’s Big Five traits show structural continuity by the time children are school age (De Fruyt et al., 2006). Youth’s self-reports on an adult Big Five measure increasingly conform to a Big Five factor structure with age (Soto, John, Gosling, & Potter, 2008). A Big Five structure clearly characterizes children’s traits by elementary-school age, but some evidence indicates that such a structure accurately may depict children’s traits even during the preschool years (De Pauw, Mervielde, & Van Leeuwen, 2009).

There is clear conceptual overlap between the traits identified in temperament research and the traits assessed in personality research in children. A recent study of preschoolers examined the empirical
relationships among prominent temperament and personality measures to determine whether the conceptually similar traits, in fact, do relate to one another (De Pauw, Mervielde, & Van Leeuwen, 2009). In this study, the researchers investigated the factor structure of scales from three temperament measures and one Big Five measure and obtained evidence for six factors: sociability (low shyness and high expressiveness and sociability), activity level (high energy, activity level, impulsivity), conscientiousness (high attention, achievement motivation, persistence, creativity, and curiosity), disagreeableness (high irritability, egocentrism, anger and low compliance, altruism, and adaptability), negative emotionality (high sadness, fear, anxiety, and negative intensity), and sensitivity (high pleasure in a wide variety of tactile, auditory, and visual experiences). The results suggest that temperament and personality traits relate in meaningful ways to each other and suggest that the Big Five Model may provide an overarching structure for children's individual differences, with some developmental modifications.

The Basic Traits From Preschool Age Through Adolescence

Taken together, the studies on trait structure provide a promising starting point for a taxonomy of children's traits in the years from preschool age through adolescence. This section describes the basic traits that have been identified, some of their likely components, and, briefly, processes that may underlie these differences.

**Extraversion or positive emotionality** describes children's tendencies to experience high positive affect, including joy and enthusiasm, and to engage the world in a vigorous, active, and surgent fashion. Infants and young children vary in their expression of positive emotions, such as pleasure, joy in social interactions, and laughter (Neppl, Donnellan, Scaramella, Widaman, & Spilman, 2010; Rothbart & Bates, 2006), and, as noted previously, this trait often is called *surgency* or *positive emotionality* (Putnam, 2012). Extraverted children are sociable, assertive, energetic, and expressive versus socially inhibited and passive. In preschoolers, this trait seems to involve at least two separable components: *sociability*, meaning the tendency to be more expressive and eager to interact with others, and *approach* or *activity level*, including the eagerness to approach new situations and a high level of physical activity (De Pauw et al., 2009; Dyson et al., 2012). Both components involve energetic and engaged positive emotions, but sociability focuses on social contexts and approach typically focuses on other contexts. The trait of extraversion may be somewhat less coherent earlier in childhood than later in childhood and adolescence (Soto et al., 2008), in part because these two components are separate in childhood, and the latter component may be as related to impulsivity and low constraint as to extraversion (Deater-Deckard et al., 2010; Degnan et al., 2011; Kochanska, Aksan, Penney, & Doobay, 2007). The overarching trait of extraversion or positive emotionality appears to reflect individual differences in a biologically based approach system that activates behavior to seek rewards (Depue & Fu, 2012; DeYoung et al., 2010; Shiner & DeYoung, 2013).

**Neuroticism or negative emotionality** taps children's differences in susceptibility to negative emotions and general distress. In early childhood, the trait includes children's tendencies toward fear, irritability and frustration, and difficulty with being quieted after high arousal (Rothbart, 2011). Children and adolescents who are high on neuroticism are described as fearful, tense, “falling apart” under stress, moody, low in frustration tolerance, and interpersonally insecure. In contrast, children low on this trait are self-assured, emotionally stable, and calm. Thus, compared with the early childhood manifestations of this trait, neuroticism includes components—such as insecurity, jealousy, fear of failing, and concern about acceptance—that only become expressed as children develop greater awareness of themselves and stronger capacities to think about the future.

Although children vary in their general tendencies toward experiencing negative emotions, they show different tendencies toward particular families of negative emotions as early as infancy (Rothbart, 2011) and the preschool years (Dyson et al., 2012; Gagne et al., 2011). Specifically, children display separable tendencies toward fear (Kagan, 2012) and toward anger, irritability, and frustration.
(Deater-Deckard & Wang, 2012). Tendencies toward sadness may form yet another trait (Majdandžić & van den Boom, 2007). Children’s tendencies toward fear have received particular attention in Kagan and colleagues’ research on behavioral inhibition, the propensity to withdraw and express fear in the face of stressful and novel situations (N. A. Fox, Henderson, Marshall, Nichols, & Ghera, 2005; Kagan, 2012). In the previously described study examining temperament and personality trait questionnaires together (De Pauw et al., 2009), fear was one part of a broader negative emotionality trait that included anxiety, general distress, discomfort, and sadness, whereas irritability and anger were more related to a disagreeableness dimension. Thus, these early manifestations of different negative emotions likely become part of different overarching traits with age. The overarching trait of neuroticism appears to reflect individual differences in a biologically based withdrawal system that motivates behavior to avoid threats (Depue & Fu, 2012; DeYoung et al., 2010; Shiner & DeYoung, 2013).

Conscientiousness or effortful control reflects children’s individual differences in self-control particularly in contexts where self-control is used in the service of constraining impulses and striving to meet standards. In infancy, children vary in their abilities to focus attention and demonstrate satisfaction during low-intensity activities, and by a little later in childhood, this tendency—then termed effortful control—expands to include the abilities to sustain attention, inhibit impulses, and engage in planning (Rothbart, 2011). The trait and its components (e.g., persistence or interest, inhibition of impulses) may be measured effectively using behavioral tasks (Dyson et al., 2012; Gagne et al., 2011; Kochanska & Knaack, 2003; Majdandžić & van den Boom, 2007). Effortful control is a robust unitary construct, as demonstrated by two recent studies; one found that children’s responses to affectively salient and affectively neutral inhibitory control tasks formed a single trait (Allan & Lonigan, 2011), and the other found that diverse behavioral task, questionnaire, and test-based measures of attention, inhibitory control, and impulsivity cohered as a single measure of effortful control (Sulik et al., 2010). A related construct receiving considerable attention in clinical and cognitive neuroscience research is executive functioning, which involves top-down processes through which people control their attention, cognition, and behavior (Garon, Bryson, & Smith, 2008; Wiebe, Espy, & Charak, 2008; Zelazo & Cunningham, 2007).

Although there is evidence for some links between executive functioning and effortful control (Duckworth & Kern, 2011), the relationship between the two is not entirely clear, as the two domains often are studied separately (Zhou, Chen, & Main, 2012).

Like effortful control, conscientiousness captures children’s capacities for self-control, including their abilities to persist at tasks and to be planful, cautious, and deliberate in their actions, but conscientiousness also includes traits such as orderliness, dependability, and motivation to strive for high standards. Empirically, the two traits are highly related (De Pauw et al., 2009; Halverson et al., 2003); however, as with executive functioning, more research is needed to clarify how the two constructs converge and diverge. Effortful control and conscientiousness are both important predictors of academic success and better social-emotional functioning in childhood and across time into adulthood (Duckworth & Allred, 2012; Eisenberg, Spinrad, & Eggum, 2010; Liew, 2012; Shiner, 2000) and thus are important targets for study and intervention. Individual differences in these traits appear to be related to variations in the executive attention network and the anterior cingulate cortex (DeYoung et al., 2010; Posner & Rothbart, 2007; Rueda, 2012; Shiner & DeYoung, 2013).

In addition to the three traits just described, which have clear counterparts in temperament research, two additional traits characterize children: agreeableness and openness to experience or intellect. Agreeableness describes children’s tendencies to be cooperative with limits set by adults and to be helpful, empathic, kind, and considerate, rather than selfish, egotistical, noncompliant, aggressive, and hurtful. Researchers have speculated that agreeableness may arise in part from early differences in effortful control (Ahadi & Rothbart, 1994), and, indeed, numerous studies do show links concurrently and across time between markers of self-control and agreeableness (Jensen-Campbell, Knack,
There is good reason to believe, however, that agreeableness arises from a related, but still separable, set of individual differences that are not merely part of effortful control. In a recent study examining parents’ ratings of the temperament and personality traits of their preschool children, a disagreeableness factor clearly emerged, and this factor was separate from the dimension of effortful control (De Pauw et al., 2009). The trait included typical markers of agreeableness (high altruism and compliance and low egocentrism and willfulness) as well as temperamental measures of children’s tendencies to respond to challenging situations with anger, frustration, inflexibility, or poor adaptability. Like negative emotionality, low agreeableness includes tendencies toward externalizing emotions like anger and irritability, and, indeed, the two traits typically are correlated in childhood (Shiner & De Young, 2013); however, low agreeableness typically focuses more on the hostile expression of these traits in interactions with others, rather than on just the experience of such negative emotions.

In addition to these negative traits, agreeableness includes a number of positive traits indicating greater responsiveness to others’ emotions and needs. Basic capacities for empathy and altruism can be observed in other species, including apes, dolphins, and elephants, and are an important aspect of human evolutionary history (de Waal, 2008); these tendencies may have promoted greater altruism toward kin, parental care of offspring, and pair bonding. Thus, it is not surprising that human individual differences in empathy and prosocial behavior emerge early in life, even by the toddler and preschool years (Knafo & Israel, 2012). These traits appear to be moderately stable and genetically influenced during these early years (Knafo & Israel, 2012). Given that agreeableness is associated with more positive relationships across the life span (Jensen-Campbell et al., 2010), it will be important to learn more about the temperamental origins of this trait as well as how it relates to other critical childhood tendencies, such as the development of moral conduct, affect, and self-views (Kochanska, Koenig, Barry, Kim, & Yoon, 2010).

Openness to experience (sometimes called intellect) includes variations in tendencies to explore, seek, and attend to external and internal sensory stimulation and abstract information. In the Big Five studies, children characterized by high openness are perceptive, curious, creative, and eager to learn. Such children tend to be more invested in extracurricular activities, imaginative in play, confident, and adaptable in the face of uncertainty (Abe, 2005; Goldberg, 2001; Mervielde & De Fruyt, 2002; Shiner & Masten, 2008). In adults, the trait includes related but separable tendencies toward openness, which is focused on perceptual and aesthetic interests, and intellect, which is focused on intellectual interests (DeYoung, Quilty, & Peterson, 2007). Similarly, in children, the trait seems to split into a first component that includes imagination, curiosity, openness to varied interests, and creativity and a second component that includes capacity for learning and perceptiveness (Halverson et al., 2003; Mervielde & De Fruyt, 2002). The Big Five studies consistently indicate that this trait can be assessed reliably by the elementary school years (Caspi & Shiner, 2006); the trait sometimes is measured coherently in preschool as well. Although openness is not a trait included in childhood temperament models, it may be related to a dimension measured in Rothbart’s temperament model—sensory sensitivity (Evans & Rothbart, 2007; Rothbart, 2011). This trait seems to go beyond just awareness of sensory experiences to enjoyment of a wide variety of tactile, auditory, and visual experiences (De Pauw et al., 2009), which is idea consistent with the theory that openness involves positive affective engagement with stimulating experiences (Shiner & DeYoung, 2013). Not surprisingly, the trait of openness is correlated with the trait of extraversion in both youth and adults (Shiner & DeYoung, 2013), presumably because both traits involve positive engagement with stimuli; extraversion focuses largely on engagement with more social experiences and openness focuses more so on active engagement with nonsocial situations.

**STABILITY AND CHANGE IN TEMPERAMENT AND PERSONALITY TRAITS**

Although temperament and personality traits are defined in part by the criterion that they show at least some stability across time, considerable evidence now
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exists for both continuity and change in these traits in all developmental periods. This section first addresses findings for two types of continuity and change in childhood and adolescence—mean-level and rank-order stability and change. The section then turns to a brief review of research on two key causes of trait stability and change—genetic influences and a range of contextual influences.

Mean-Level Stability and Change

Mean-level change refers to changes in the average trait level of a population. In other words, investigations of mean-level change address the question of whether people, on average, tend to increase or decrease on particular trait measures during different periods of life. This type of change typically is investigated by examining mean levels of traits for the same cohort longitudinally; however, it sometimes is investigated by comparing mean trait scores for individuals of different ages assessed cross-sectionally. It is preferable to measure mean-level change longitudinally within the same sample to ensure that differences found across different age cohorts are due to true mean-level changes, not generational differences. Cross-sectional studies, however, may be valuable as a starting point for studying mean-level change if they include very large and diverse samples. Mean-level change could result from biological changes that characterize development during different phases, from social experiences that are normative during certain periods of life, or from a combination of the two (Edmonds, Jackson, Fayard, & Roberts, 2008). Research on mean-level change thus highlights the trait changes that are normative for youth during different periods of childhood and adolescence.

Early childhood. Relatively few studies have examined mean-level changes in temperament traits during the early childhood years, from infancy through preschool, although data on mean-level changes are embedded in some studies not focused on that topic. In early childhood, there are several discernible patterns. During the first year of life, infants begin to express the primary emotions of joy, surprise, fear, anger, and interest (Lewis, 2010), which means that mean levels of individual differences in those emotions should increase over time. Positive emotionality tends to increase during the first year of life, as infants develop stronger tendencies to smile, vocalize, and laugh (Bates, Schermerhorn, & Goodnight, 2010). Patterns for negative emotionality are best understood by looking at fear or behavioral inhibition and anger separately. There is relatively little known about changes in mean levels of fear or behavioral inhibition, but the biological fear system begins to come online in the latter part of the first year of life (Rothbart & Bates, 2006), which would suggest that fear and inhibition should increase during this first year, just as positive emotionality does. Similarly, mean levels of trait anger gradually increase over the first several years of life (Deater-Deckard & Wang, 2012). In terms of early markers of agreeableness, average levels of empathy and prosocial behavior increase during the first several years (Eisenberg, Fabes, & Spinrad, 2006; Knafo & Israel, 2012), and overt hostility in the form of physical aggression likewise increases from infancy onward and then peaks around the age of 3 years (Tremblay & Nagin, 2005). Some evidence suggests that agreeableness and openness to experience also increase during early childhood (Lamb, Chuang, Wessels, Broberg, & Hwang, 2002). Taken together, the preliminary research on emotion-based traits indicates that the mean levels of such traits tend to increase in early childhood, as these traits become better-established aspects of individuality. More research on mean-level change is needed to draw firm conclusions, however.

In addition to changes in more emotion-focused traits, it is important to consider the development of the more self-regulatory aspects of temperament, specifically attention and effortful control. During the latter part of the first year of life, several attentional systems come online (Posner & Rothbart, 2007; Rothbart et al., 2007; Rueda, 2012): an alerting system that maintains readiness for incoming stimuli, an orienting system that enables selection of incoming stimuli to attend to, and an executive attention system that fosters awareness and resolution of competing sources of information. These attention systems permit early forms of self-regulation, as infants use attention to modulate their reactions to experiences (Rothbart, 2011). During the next
several years of life, children’s capacities for self-regulation expand and grow significantly stronger, and children begin to exercise more voluntary forms of self-control, for example, in tasks that require them to inhibit a dominant response in favor of performing a nondominant response (Kochanska, Murray, & Harlan, 2000; Rothbart et al., 2007; Rueda, 2012). Children also become better at delaying gratification during the preschool years (Li-Grining, 2007). Thus, there are dramatic mean-level increases in effortful control during the early childhood years.

Preschool and elementary school years. Moving now to mean-level changes from the preschool years through the late elementary school years, traits related to self-regulation continue to increase across the transition from preschool to elementary school and during the elementary school years (Rueda, 2012). Higher mean levels have been found among older children, for example, on questionnaire and behavioral measures of task persistence (Deater-Deckard, Petrill, Thompson, & DeThorne, 2006; Zhou et al., 2007), a behavioral measure of emotion regulation (Simonds, Kieras, Rueda, & Rothbart, 2007), teacher and parent reports of behavioral regulation (Murphy, Eisenberg, Fabes, Shepard, & Guthrie, 1999), and behavioral measures of attentional persistence and efficiency of executive attention (Simonds et al., 2007; Zhou et al., 2007). The gains in attention and executive functioning skills that take place during the later preschool period (Garon et al., 2008) and school-age years (Best & Miller, 2010) may be one cause of the observed improvements in self-regulation-related traits.

Again, as for the early childhood years, the data on mean-level change in traits beyond effortful control are sparser. In some studies, extraversion appears to decrease from preschool or early elementary school through the later school-age years (Lamb et al., 2002; Prinzie & Dekovic, 2008). These findings are consistent with results of another study indicating that positive emotional intensity decreases from early elementary school through early adolescence (Sallquist et al., 2009); however, not all studies have found such a change (e.g., De Fruyt et al., 2006). Neuroticism may tend to increase from preschool through elementary school or in the early elementary school years (Lamb et al., 2002; Prinzie & Dekovic, 2008), at least when the trait is measured with a focus on internalizing negative emotions, but it then seems to stabilize later in elementary school. In contrast, children’s tendencies toward anger decrease during the later preschool years (Cole et al., 2011; Deater-Deckard & Wang, 2012) but then show little mean-level change later in elementary school (Deater-Deckard & Wang, 2012). There is some evidence for a decrease in the overall intensity of negative emotional experiences in elementary school (Sallquist et al., 2009) and for general decreases in negative emotional intensity from the preschool years through late elementary school (Murphy et al., 1999). In some studies, agreeableness increases across the school-age years (Lamb et al., 2002; Prinzie & Dekovic, 2008), continuing the pattern seen earlier in childhood, although not all studies have found an increase (e.g., De Fruyt et al., 2006). Findings for openness are inconsistent, with one study showing a decrease in the elementary years (Prinzie & Dekovic, 2008) and another study showing no changes for most of elementary school (De Fruyt et al., 2006).

Altogether, findings suggest that, relative to preschool-age children, elementary-school children are better at regulating their emotions, with lower levels of intense positive and negative emotions (particularly anger), and higher levels of agreeableness. It seems likely that the continuing improvements in effortful control contribute to such changes. After some significant changes in the transition from preschool to elementary school, the elementary school years are a relatively more stable period in terms of mean-level personality change.

Adolescence. In contrast to the relative stability of the elementary years, there may be more substantial mean-level trait changes in the transition from late childhood to adolescence, and then during the adolescent years. A meta-analysis of mean-level change in personality traits seemed to indicate relatively few mean-level changes during late childhood and adolescence (Roberts, Walton, & Viechtbauer, 2006). Other studies suggest that there may be some mean-level changes during this phase of life, however, and these can be found only by looking
The Development of Temperament and Personality Traits in Childhood and Adolescence

Rank-Order Stability and Change

Rank-order stability refers to the degree to which the relative ordering of individuals on a given trait is maintained over time. Rank-order stability is high if people in a group maintain their position on a trait relative to each other over time, even if the group as a whole increases or decreases on that trait over time. It typically is indexed by correlations between scores on the same trait measure across two points in time (i.e., test-retest correlations), although it sometimes is assessed through cross-time correlations of different measures of the same trait at different times. Because researchers and laypeople alike are intrigued by the question of whether youth tend to maintain their traits over time, there are far more studies of rank-order stability than of mean-level stability.

The existing evidence suggests that temperament and personality traits show both stability and change in childhood and adolescence. The most comprehensive information on rank-order stability comes from Roberts and Del Vecchio’s (2000) meta-analysis of studies examining the stability of temperament and personality traits from childhood through adulthood. The meta-analysis demonstrated that traits become increasingly stable over the life course. The following estimated population cross-time correlations for dispositional measures were obtained for childhood and adolescence: 0–2.9 years = .35; 3–5.9 years = .52; 6–11.9 years = .45; and 12–17.9 years = .47. These results suggest that individual differences show more modest continuity during infancy and toddlerhood and then show a rather large increase in stability during the preschool years. This level of stability is maintained through the young adult years. Traits do not become more highly stable until people are in their 50s. Roberts and Del Vecchio computed the cross-time correlations separately for temperament traits and personality traits and found somewhat lower estimated population correlations for temperament traits (mostly in the range of .35–.47) than for personality traits (in the range of .50–.54); however, this difference was accounted for entirely by the fact that the temperament traits were assessed in children, who display lower trait continuity than adults, and most personality trait studies focused on adults.

Later studies have expanded on the findings of the Roberts and Del Vecchio (2000) meta-analysis in two important ways. First, although laboratory assessments of temperament tend to show only modest to moderate stability in the infant and toddler years (reviewed in Durbin, Hayden, Klein, & Olino, 2007),
there is some evidence for higher stability of laboratory- assessed temperamental traits later in childhood. In a study of behavioral task measures of positive and negative emotionality (Durbin et al., 2007), the overarching trait measures and their components demonstrated moderate to strong stability over various intervals from ages 3 to 7 years, comparable in magnitude to the estimates of stability for that age span obtained in the Roberts and Del Vecchio meta-analysis. Behavioral task measures of effortful control likewise have demonstrated strong stability by the preschool period (Kochanska & Knaack, 2003). Laboratory measures of behavioral inhibition, assessed categorically rather than dimensionally, show at least moderate continuity in childhood as well (Kagan & Fox, 2006). Second, since the publication of the meta-analysis, a number of studies have examined rank-order stability of the Big Five traits in childhood and adolescence using well-developed measures of these traits, and these studies have confirmed the pattern of increasing stability of traits as youth progress through the childhood and adolescent years (De Fruyt et al., 2006; Klimstra et al., 2009; Prinzie & Dekovic, 2008; Pullmann et al., 2006). These studies often obtained higher cross-time estimates of stability than were obtained in the meta-analysis, especially over shorter time intervals of 1 or 2 years. Thus, later studies have broadened the meta-analytic findings to laboratory assessments and to studies explicitly examining the set of Big Five traits in childhood and adolescence. These studies have confirmed the basic pattern of moderate trait stability by the preschool years and increasing stability across time.

Sources of Stability and Change in Youth’s Traits: Genetics and Contextual Influences

The studies on rank-order change and stability demonstrate that youth, indeed, may change in their relative standing on temperament and personality traits over time. This section provides a brief review of two possible sources of change versus stability—genetic factors and contextual influences.

Behavior genetic research on stability and change. A handful of behavior genetic studies have addressed the question of whether genetic influences, environmental experiences, or both contribute to the stability and change in youth’s traits over time. By using a twin study design that measures twin pairs’ standing on temperament and personality traits at two or more points in time, it is possible to parse the genetic and environmental components that contribute to the covariance and differences in those trait scores over time. Different genetic influences on the same trait may emerge at different points in development, just as different environments may lead to differences in traits over time (Saudino & Wang, 2012).

Across a number of behavior genetic studies looking at young children, a common pattern has emerged for the contributors to stability and change in various temperament traits. In these studies, genetic influences account for most of the stability in temperament traits over time, including observer-rated activity level, positive affect or extraversion, task orientation, and behavioral inhibition during the toddler and preschool years (Saudino & Cherny, 2001; Saudino, Plomin, & DeFries, 1996); activity level assessed via actigraph at ages 2 and 3 years (Saudino, 2012); observers’ ratings of task persistence in preschoolers and school-age children (Deater-Deckard et al., 2006); and parent ratings of prosocial behavior obtained at multiple points from ages 2 to 7 years (Knafo & Plomin, 2006). In two exceptions, both genetic and shared environmental factors (family-wide factors promoting sibling similarity) were found to account for trait stability—one a study of observed empathic behaviors in young children (Knafo, Zahn-Waxler, Van Hulle, Robinson, & Rhee, 2008) and the other a study of observer-rated shyness in the toddler and preschool years (Saudino & Cherny, 2001; Saudino et al., 1996). Despite these exceptions, the general pattern remains one of genetic factors being the primary contributor to trait stability, a notion consistent with most theoretical conceptions of temperament (Saudino & Wang, 2012).

In contrast to the findings for trait stability, change in childhood temperament traits tends to be accounted for by both genetic factors and nonshared environmental factors, which are child-specific aspects of the environment that differentiate siblings from one another. This pattern for the sources of
change was true in almost all of the previously cited studies, which examined activity level, positive affect or extraversion, task orientation, behavioral inhibition, and empathy (Knafo et al., 2008; Saudino, 2012; Saudino & Cherny, 2001; Saudino et al., 1996). In several studies, only nonshared environmental factors contributed to trait change, specifically for the traits of task persistence (Deater-Deckard et al., 2006), prosocial behavior (Knafo & Plomin, 2006), and shyness (Saudino & Cherny, 2001; Saudino et al., 1996). These findings are significant for two reasons. First, they suggest that children’s unique environments may cause them to shift their relative standing on temperament traits over time; thus, it is worth considering which environmental factors may account for change in which traits (a topic discussed in the next section). Second, the findings indicate that genetic factors account for both stability and change for some traits; in other words, the role of genetics is dynamic and more complicated than originally conceived. New genetic effects that are independent from earlier ones emerge at later points in time for a wide variety of traits.

A small number of studies have examined sources of trait stability and change in older children and adolescents. In one study of parent-rated temperament change in adolescence (Ganiban, Saudino, Ulbricht, Neiderhiser, & Reiss, 2008), genetic factors accounted for stability from mid- to late-adolescence, whereas genetic and nonshared environmental factors accounted for change in the traits of negative emotionality, activity level, sociability, and shyness. This pattern is the same as that observed for earlier childhood temperament and for personality traits in adulthood (Krueger & Johnson, 2008). Several studies of personality traits in adolescence have showed a significant role for genetic factors in explaining trait continuity (Bratko & Butkovic, 2007; De Fruyt et al., 2006; Gillespie, Evans, Wright, & Martin, 2004), but findings for other contributors to trait continuity and change have varied. Taken together, the research on sources of continuity and change suggest that, across childhood and adolescence, genetic factors explain trait continuity and that nonshared environmental factors help to explain discontinuity, but that new genetic influences on traits sometimes emerge at later points as well.

Environmental contributors to trait change. The behavior genetic studies of trait stability and change clearly document that nonshared environmental experiences contribute to changes in temperament and personality trait change in childhood and adolescence. Follow-up studies are needed, however, to pinpoint the specific environmental features that contribute to trait changes over time. It is important to note the difference between studies examining environmental contributors to trait change and studies testing whether youth’s traits interact with their environments to predict nontrait outcomes. This chapter addresses the former type of study; the best of these studies control for earlier levels of the trait and focus on changes in those traits. Many different studies of the latter type have been conducted, examining a wide variety of outcomes, including internalizing symptoms and competence and adaptation in the areas of academics, social competence, and emotion regulation (Bates, Schermerhorn, & Petersen, 2012; Caspi & Shiner, 2008; Lengua & Wachs, 2012; Rothbart & Bates, 2006).

Parenting and other aspects of family functioning predict changes in children’s emotion-focused traits during childhood. Little is known about change in positive emotionality, but in a study examining changes in infants’ positive emotionality, infants whose parents had healthier relationships or who engaged more positively with them showed increases in positive emotionality (Belsky, Fish, & Isabella, 1991). In contrast to the sparse literature on changes in positive emotionality, more is known about changes in negative emotionality and its components. Across several studies, young children’s negative emotionality tended to decrease when their caregivers responded to them with high sensitivity and responsiveness (Bates et al., 2012). Children’s negative emotionality seems to be worsened by disorganized, chaotic, and noisy home environments (Matheny & Phillips, 2001) and by parents’ punitive responses to expressions of negative emotions (Eisenberg et al., 1999). Findings for the narrow-band trait of behavioral inhibition are somewhat different from those for negative emotionality more
generally. Behaviorally inhibited children receiving intrusive, derisive, or overprotective parenting remain more consistently inhibited across time than inhibited children receiving other kinds of parenting (N. A. Fox et al., 2005). Nonparental care may contribute to decreasing inhibition over time (N. A. Fox et al., 2005). Negative emotionality in general thus tends to decrease when parents respond by providing an environment that helps children manage their negative emotions—specifically, a sensitive, nonpunitive, calm, and organized environment. In contrast, behaviorally inhibited children appear to benefit from contextual experiences that provide supportive opportunities to overcome their fears.

Some evidence suggests that changes in children’s self-control and regulation are predicted by environmental factors as well. For example, improvements in effortful control or behavioral control have been predicted by greater maternal responsiveness (Kochanska et al., 2000) and by lower levels of punitive responses (Eisenberg et al., 1999). In contrast, high levels of family risk factors (e.g., single parenting, low parental education, poverty) have been associated with declines in task persistence (Halverson & Deal, 2001) and with lower levels of executive control (Li-Grining, 2007). These findings are consistent with a broader literature that indicates that children with weaker self-control are more vulnerable to the negative effects of adverse parenting (Bates et al., 2012; Rothbart & Bates, 2006) or broader environmental disadvantages such as risky neighborhoods or dropping out of school (Caspi & Shiner, 2008; Lengua & Wachs, 2012; Meier, Slutske, Arndt, & Cadoret, 2008). Children with weaker self-regulation seem to benefit most from supportive, highly structured environments that support greater internalization of self-control.

CONCLUSION AND FUTURE DIRECTIONS

Over the past two decades, considerable progress has been made in tracing the form of temperamental and personality traits in children and adolescents and in investigating the nature of stability and change in those traits. This section summarizes the main conclusions from each section of this chapter and offers suggestions for ways to expand on current knowledge.

The Basic Nature of Temperament and Personality Traits

The classical view of the relationship between temperament and personality traits was that temperament traits emerge early and are the most basic, biologically derived form of individual differences, whereas broader personality traits develop later as the product of temperament traits in interaction with the environment. In other words, in this model, personality traits arise as life experiences layer new facets onto the basic temperament traits. Newer research suggests flaws with this model, given that biological and environmental factors interact with each other across the life span. A more accurate perspective is likely to be that temperament traits are earlier manifestations and personality traits are later manifestations of the same basic traits and that both are the result of complex interactions among genetic, biological, and environmental factors across time.

Empirical research could assess the accuracy of this model by tracing in finer detail the gradual expansion of children’s individual differences without judging at the outset whether the traits fit a preconceived notion of temperament. Personality traits, as measured in childhood, include important components that their temperament counterparts lack (e.g., childhood neuroticism includes insecurity, jealousy, fear of failing, and concern about acceptance, in addition to the more general predisposition to negative emotions that emerges earlier in life). Behavior genetic studies could be used to assess whether the newer components that emerge in each stage of development derive from the same genetic or environmental factors as the earlier components.

Temperament and Personality Trait Structure in Childhood and Adolescence

Research on structure has proceeded differently for temperament traits and personality traits in childhood. Although questionnaires have been the primary means of exploring structure for both sets of traits, temperament research on structure also has included behavioral tasks, observational methods, and peer ratings. Work on temperament structure starts with a narrow set of trait descriptors based on
the researcher’s view of what constitutes temperament, whereas some personality structure research has started with broader pools of traits. Despite these differences, the two traditions have converged on a shared set of three traits—extraversion or positive emotionality, neuroticism or negative emotionality, and conscientiousness or effortful control—and the personality tradition adds agreeableness and openness to experience or intellect, both of which potentially could be considered temperament traits as well.

One overarching suggestion is that research in this area would profit from greater consideration of personality traits in childhood and adolescence, rather than merely traits labeled as temperament. Research on temperament in childhood far outpaces research on personality traits, but research on a broader range of traits has the potential to illuminate more about children’s relatively consistent dispositions. Temperament researchers have made considerable progress in detailing the biological and psychological processes underlying variations in temperament traits (Zentner & Shiner, 2012), but less is known about the processes underlying traits during middle childhood and adolescence than during the earlier years. Research on the processes underlying adult personality traits has flourished in the years since the field converged on the Big Five model for traits; similar progress can be made for childhood traits, now that consensus is greater about the structure of traits. In addition, it would be helpful for researchers to explore the relationships between temperament or personality traits and other individual differences that have received considerable attention in the developmental literature—for example, executive control, emotion regulation, conscience and moral development, and mastery motivation. Potentially, enough overlap between childhood traits and these other constructs may make it is redundant to study the two separately. On the other hand, in some instances, traits may be separable from these other constructs, and it may then be possible to investigate further how temperament contributes to the development of these other important individual differences (Shiner & Caspi, 2012).

Stability and Change in Traits in Childhood and Adolescence

Youth’s traits show discernible patterns in terms of both mean-level and rank-order stability and change. Mean levels of traits tend to increase overall during the early childhood years, as the traits become better-established aspects of individuality; thus, children become more extraverted, active, emotionally negative, self-controlled, and empathic or prosocial as they move from infancy through the preschool years. As children transition to the elementary school years, mean levels of intense emotional traits tend to decrease (positive emotionality, negative emotionality), whereas self-control and agreeableness continue to increase. During the transition to adolescence, mean levels of traits sometimes change in a negative direction (e.g., youth become less conscientious, and girls increase in negative emotions), but traits tend to shift in a more positive direction again later in adolescence. In terms of rank-order stability, moderate trait stability is seen by the preschool years, but stability continues to increase with age. Trait stability is accounted for in large part by genetic factors, whereas non-shared environmental factors often account for changes in traits over time; in addition, new genetic effects on traits sometimes emerge, and these also may lead to trait change over time as well. Family factors, along with broader contextual influences, predict changes in traits over time.

Although it is possible to discern a number of patterns in terms of stability and change in youth’s traits, far more work in this area is needed. There are relatively few studies on mean-level change, despite the importance of such studies for describing normative developmental patterns in the first two decades of life. Much more is known about rank-order stability, but more long-term studies of change and stability (e.g., tracking stability and change over two decades or more) would be helpful because most studies of rank-order stability among youth have a shorter time window. Finally, it will be important for researchers, parents, clinicians, practitioners, and policy makers to recognize that trait change is possible and to cultivate a better understanding of the sources of that change. In particular, more information is needed that clarifies what...
environmental and intrapersonal factors contribute to changes in youth’s traits over time. Some traits have received little attention in this regard (e.g., extraversion), and contextual factors outside the family likewise are understudied. The investigation of personality development would be deepened by research that examines youth in a broader range of real-world contexts. Children and adolescents around the globe experience many day-to-day challenges. Extreme adversity, including significant poverty, violence, and illness, may have negative effects on personality development (Belfer, 2008; Hart, Atkins, & Matsuba, 2008). A more complete understanding of how children develop more positive traits, even in the face of adversity, would provide clues for prevention and intervention.

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