

# A Socioecological Developmental Systems Approach for the Study of Human Resilience

Ingrid Schoon

## Introduction

Within a systems approach of human development, the notion of resilience generally describes the process of avoiding adverse outcomes or doing better than expected when confronted with major assaults on the developmental process (Luthar, Cicchetti, & Becker, 2000; Masten, 2016). It refers to the capacity to anticipate, adapt, and reorganize itself in the face of adversity enabling the maintenance of or return to effective functioning (Folke, 2016; Ungar, 2019). Resilience is understood as an interactive concept, which cannot be directly measured, but has to be inferred from individual variations in response to significant levels of stress or adversity. It can manifest in various ways, such as maintaining stable functioning (sustainability), recovery after an initial stress response (bouncing back), and adaptation to or transformation of existing structures (Ungar, 2019). Although resilience is evident in individual behavior, it is not a personality characteristic. Without exposure to a risk there can be no evidence of resilience.

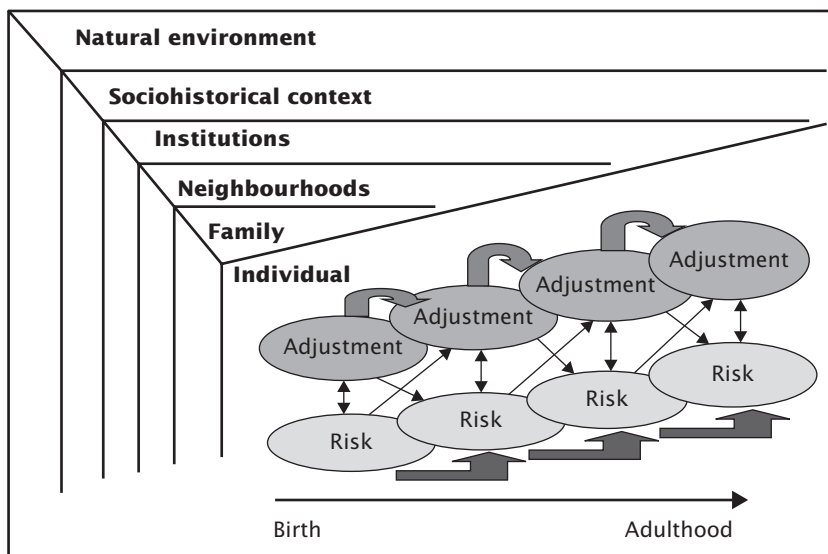
Resilience is a process, which emerges through the ongoing interactions between a developing individual and a changing context, reflecting the capacity to maintain or regain effective functioning in the face of adversity and constant change (Schoon, 2006, 2012). Which interactions are a likely catalyst for resilience depends on the nature of the adversity encountered, the level of response under study, the timing of their co-occurrence, and the wider context in which these interactions occur. For example, individuals might respond

differently to exposure of distinct risks, such as the experience of parental divorce, depending on whether parents had been quarrelling a long time before breaking up, the length and intensity of exposure to these quarrels, the age at which the child witnessed the events, and the role of significant others in their lives, such as siblings, relatives or peers, as well as the wider sociocultural context (Amato, 2010).

As such, the study of resilience requires a socioecological and developmental systems approach, taking into account characteristics of the individual as well as characteristics of the individual's wider context, the processes of person–context interactions, their timing, and their development over time. The idea of socioecological developing systems is informed by theoretical biology and approaches to differentiate living from nonliving (or mechanical) matter. Living systems are understood as a unified whole (von Bertalanffy, 1968), where different levels of influence are interrelated and each characterized by self-activity and historicity. The aim of this chapter is to introduce a socioecological developmental systems approach for the study of human resilience, specifying the different layers of influence and their interactions over time and in context.

## Resilience: A Multilevel, Relational, and Dynamic Process

The dynamics and interactions of a multisystemic model of resilience are depicted in Figure 18.1. The primary focus of the model is individual-level adjustment, which is shaped by individual characteristics as well as influences from within the family context, neighborhoods, social institutions, the wider sociohistorical context, and the natural environment. These layers define the “action field” in which individual development takes place (Heckhausen &



**FIGURE 18.1** A socioecological developmental systems model of resilience. Adapted from Schoon (2006).

Buchmann, 2018). The model captures the transactional nature of development over time, focusing on the reciprocal interactions and feedback loops between risk experiences and individual adjustment over time and in context (Schoon, 2006).

## Multiple Levels of Influence

Individual and context are understood as self-regulating, interdependent, and developing systems, where multiple levels of influence shape individual functioning and development. Each of the layers can be conceptualized as a system and further reduced to their component parts to get a proper understanding of a given system. For example, individual-level systems are composed of genetic, biological, cognitive, social, emotional, and motivational aspects. Social systems are characterized by different actors, organization, and institutions; shared norms and values; social roles and functions; and processes of interaction, regulation and control. Yet, the properties of each of these systems cannot be determined or explained by the sum of their component parts alone. Instead, the general system as a whole determines how the parts behave. For example, countries differ in their sociodemographic composition (such as the size or the age of the population) and the regulations of access to healthcare, child care, education, or housing. Focusing just on Europe (Esping-Anderson, 2002), social welfare in Scandinavian countries is orientated toward the individual, granting rights and benefits as universal entitlements. In many Anglo-Saxon countries (i.e. the United Kingdom, Ireland, or, for that matter, the United States) the social welfare state is based on the belief in the efficiency of the market and minimal state interference. In Southern European countries such as Spain, Italy, or Greece, a meager or nonexistent safety net (e.g., unemployment benefits), implies that the state shifts responsibility for support to the family and kinship networks who have to take a major role in protecting their members against economic and social risks. In contrast, the coordinated market economy in Germany and German-speaking countries (Austria, Switzerland) is characterized by major interventions into free market mechanisms, ensuring that families are protected against serious decline in living standards and that a family's social status is protected. These social structures shape the demands on individuals and their ability to respond to major shocks to the system, such as the experience of an economic downturn.

Studies comparing the experiences of young people coming of age in different countries in the aftermath of the 2008 Great Recession (Schoon & Bynner, 2017, 2019b) showed that young people in Southern Europe have been hit hardest by the recession, suffering the highest levels of youth unemployment (between 30 and 55%), while those in German-speaking countries were least affected. This was mostly due to the efficient use of vocational training programs, strong linkages between education and the labor market, and pre-existing economic conditions. These findings illustrate that individual behavior and action cannot be fully understood without consideration of the wider social and ecological context in which it is embedded and how individual and context are related (Schoon & Heckhausen, 2019). Patterns of adjustment vary depending on when and where one lives (e.g., in rural versus urban areas) in the northern or southern hemisphere or specific historical periods.

The socioecological and developmental systems approach for the study of human development presented here draws on theories from across disciplines, recognizing that complex

problems, such as minimizing the impact of economic hardship and poverty and improving health, well-being, and attainment for all, require the input from different fields (Schoon, 2015; Schoon & Bynner, 2003). The systems approach is informed by social-ecological models (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006) specifying interactions from genetic to wider sociocultural contexts; life-course models stressing the importance of time and timing and the wider sociohistorical context in which development takes place (Elder, 1998); the assumptions of human plasticity (Baltes, 1987; Lerner, 1984, 1996) and human agency (Bandura, 2006; Eccles & Wigfield, 2002; Heckhausen, Wrosch, & Schulz, 2010) specifying individual-level developmental processes and their interaction with a wider social context; and ecological theory (Folke, 2016; Preiser, Biggs, De Vos, & Folke, 2018) emphasizing the embeddedness of people, communities, economies, societies, and cultures in the biosphere. Bronfenbrenner's (1979) conceptualization of context differentiates between the proximal environment, which is directly experienced by the individual (e.g., as a lack of economic resources in the family context) and more distal cultural and social value systems that have an indirect effect on the individual, such as an economic slump, which is often mediated by experiences in the more proximal context, but can also have direct effects. Bronfenbrenner's model did not specify a layer referring to the natural environment, yet human development cannot be separated from the environmental context in which it takes place, the biosphere that sustains it (Folke, 2016). Without critical ecological resources such as clean air and safe drinking water individual lives cannot succeed.

The socioecological developmental systems approach integrates individual, social, and bioecological systems theories, recognizing that the nonreductionist analysis of individual behavior requires the simultaneous description of several spheres of influence, thereby moving beyond simple cause-and-effect explanations of behavior. For example, while young people in Germany have weathered the Great Recession quite well, there is a risk that they can become "locked" into a highly structured education system offering unequal learning opportunities and subsequent path-dependent career chances, which has shown to undermine individual agency, in particular, self-concepts (Chmielewski, Dumont, & Trautwein, 2013; Holtmann, Menze, & Solga, 2017; Marsh, Trautwein, Lüdtke, Baumert, & Koller, 2007). In contrast, in countries with more flexible and permeable transition systems, such as the United Kingdom or the United States, beneficial effects of high levels of agency are more readily manifest (Evans, 2002; Heckhausen & Chang, 2009), as are the risks of unstructured transitions pathways. There are thus no unidimensional answers to questions of how individuals respond to and adapt to changing conditions.

## Co-Regulation

It is assumed that individuals and their environments are potentially malleable, whereby individuals actively shape their environment, which in turn influences them. Individual and context are understood to mutually constitute each other through processes of "co-regulation" (Sameroff, 2010; Schoon, 2012). The notion of co-regulation emphasizes the crucial role of regulation by others, which can include significant others, such as parents, peers, or teachers, as well as influences from other layers of the overall system (i.e., from institutions, the wider sociocultural and historical context, and the natural environment).

Moreover, it implies that individuals are not passively exposed to external influences but aim to gain control, to adapt and reorganize in the face of adversity, or to anticipate future goals to strive for. The goal-directedness of self-active systems, in turn, is historically situated in time and place, and comprises the adaptation to and accommodation of, external conditions and internal needs at the same time (Schoon, 2006; Schoon & Heckhausen, 2019). For example, while 30 to 40 years ago the majority of young people (in the Western world) left education after the completion of secondary school (around age 16), over the past decades there has been a huge expansion of higher education institutions coupled with shifts in the occupational structure toward higher-qualified jobs and the use of new technologies (Schoon & Bynner, 2017, 2019b). These social changes exerted substantial pressure on young people to attain higher educational degrees, and nowadays most young people expect to go to university (Rosenbaum, 2011; Reynolds & Johnson, 2011), as do their parents (Schoon, 2010). Indeed parental support for higher education participation is a crucial factor, enabling young people (in particular those from less privileged background) to succeed in achieving their goal (Franceschelli, Schoon, & Evans, 2017; Mortimer, Zhang, Wu, Hussemann, & Johnson, 2017; Sacker, Schoon, & Bartley, 2002).

## Timescales

Another important dimension of the socioecological developmental system is time and timing. Crucially, each of the different layers of the system change and interact on a range of timescales (Biggs et al., 2012), involving slow variables that determine the underlying structures and fast variables that respond to the conditions created by the slow variables. For example, social systems, such as legal or educational systems and shared traditions can be conceptualized as slow variables, while individual preferences and resulting actions can be understood as fast variables. The dynamics of the system typically arise from interactions and feedback loops between fast and slow variables. Resilience is a process of sustaining effective functioning in the face of adversity and constant change. Current experiences and level of functioning are influenced by prior experiences (the past) and anticipation of the future. Early experiences and the meaning attached to them are carried forward into subsequent situations. Early adjustment patterns influence later adjustment, and early risk experiences are linked to experience of risk at later life stages. Yet, lifelong development may also involve processes that do not originate at birth or early childhood, but are concurrent or emergent at later periods. For example, unexpected or nonnormative events, such as changes in family structure or death of a parent, or exposure to economic boom or bust, civic upheaval, war or ecological disaster can all cause a change in the conditions that impact human development for better or worse. Changes in conditions can be caused by catastrophic or sudden events as well as through gradual change, such as changes in the ecosphere.

In the following sections of this chapter I will provide broad definitions of key aspects of the interlinked systems and their interactions. These will be illustrated by examples of my own research on the factors and processes at different systemic levels that promote a smooth transition from dependent childhood to independent adulthood. The transition to independent adulthood is a key developmental task for young people, characterized by the assumption of new social roles and responsibilities against the background of increasing

uncertainty and precarity. Young people have to navigate into unfamiliar territory, adjust to new challenges, and forge new pathways and responses to demands that are as yet unknown.

## Positive Adaptation

There has been some controversy regarding the identification of positive adaptation. Adaptation can be assessed by focusing on the absence of deficits or psychopathology or through the study of competence or mastery in navigating crucial developmental tasks encountered at different life stages (Masten, 2014). Throughout the life course, the developing individual has to negotiate different developmental demands—such as learning to walk or talk during infancy, succeeding at school, establishing stable relationships, or accepting physical decline in old age. These tasks comprise processes of physical, cultural, and psychosocial maturation that represent benchmarks of adaptation in different domains and at specific developmental periods (Schoon, 2012; Ungar, Ghazinour, & Richter, 2013). Positive adaptation has to be understood as a multidimensional construct, involving cultural-specific variations (Kirmayer, Dandeneau, Marshall, Phillips, & Williamson, 2011; Franceschelli et al., 2017).

## Multidimensionality

Every developmental period has its own developmental challenges resulting from specific constellations of biological changes, role transitions, and common life events (Erikson, 1959; Heckhausen, 1999; Levinson, 1986). Coping adequately well with these changing developmental demands is considered to be a measure of adaptive functioning. It is now widely accepted that successful adaptation under adverse circumstances does not require extraordinary achievements or resources but results from “ordinary,” normative functions such as cognitive resources, self-regulation, and access to social networks (Masten, 2014). In addition, a comprehensive understanding of positive adaptation requires the recognition that human development occurs across multiple domains. For example, it is possible that a child experiencing socioeconomic hardship shows good academic performance and behavior adjustment, but at the same time develops emotional problems (Flouri et al., 2018; Schoon, 2006). Unless multiple domains of adjustment are assessed, only a partial picture of adaptation can be formulated. Adjustment in a particular domain cannot be assumed to generalize to other domains. Resilience is not an all-or-nothing phenomenon.

## Culture-Specific Variations

Moreover, the criteria used to identify effective functioning are culturally determined and differ between social, developmental, and historical contexts (Kirmayer et al., 2011; Schoon, 2006, 2012, 2017; Ungar et al., 2013). For example, there are country-specific informal norms and expectations regarding appropriate behavior and adjustment, such as the consumption of alcohol or smoking or gendered stereotypes of behavior. Within countries, these norms can differ for different subgroups of the population, defined for instance by age, gender, social background, ethnicity, or religion. These norms also concern the timing of transitions, such as age at leaving school or becoming a parent, and are associated with positive

or negative sanctions that can potentially influence individual attitudes and behaviors. Such social norms are however not universal, as subcultural norms might differ from the majority culture, and they can vary due to a changing sociohistoric context. For example, a study examining the socioemotional adjustment of three cohorts of Chinese elementary school children (assessed in 1990, 1998, and 2002) found that shyness was associated with social and academic achievement in 1990, while in 1998 the associations became weaker or nonsignificant (Chen, Cen, Li, & He, 2005). Furthermore, shyness was associated with peer rejection, school problems, and depression in 2002, illustrating the role of a changing social context. While shyness was positively associated with positive adaptation in the 1990s, in the aftermath of massive economic reforms and increasing marketization in China, shyness was associated with adjustment problems.

Furthermore, there are country-specific age-related formal (i.e., legal) norms regarding the completion of key transitions (such as age at school entry, leaving full-time education, entry into paid employment, or getting married). For example, as already mentioned, 30 years ago the majority of young people in the United Kingdom left school at compulsory minimum school leaving age (age 16) to enter full-time employment, while today nearly all 16-year-olds aspire to continue in further or higher education, although there are still variations by social background (Croll & Attwood, 2013; Schoon & Lyons-Amos, 2017). Normative, or on-time transitions, are culturally prepared by socialization and institutional arrangements and are understood to be psychologically salutary. Those who are “off-time” (too early or too late) are thought to be the target of negative social sanctions and to experience psychological strain (Heckhausen, 1999; Salmela-Aro, Kiuru, Nurmi, & Eerola, 2014; Sacker & Cable, 2010; Schulenberg & Schoon, 2012). Thus, the identification of positive adjustment is tied to normative expectations and judgments relating to particular outcomes. Given that these norms can vary for different subgroups in the population, a crucial issue in the identification of positive adjustment is the question, Resilience for whom? To avoid that certain values become reified, that the notion of resilience is abused to maintain the persistence of an existing status quo, researchers must specify the values and context-dependency of criteria underlying the identification of “successful” adjustment and evaluate their significance for representatives of different segments of society (Schoon, 2006, 2014, 2017).

## Risk and Adversity

The notion of risk used in resilience research stems from epidemiological studies identifying expected probabilities of maladjustment (Cicchetti, 1993; Rutter, 2006). Risks can comprise genetic, biological, psychological, environmental, or socioeconomic factors that are associated with an increased likelihood of adjustment problems (Luthar & Cicchetti, 2000). Risks can stem from either within or from outside the individual system. They can comprise the genetic risk of a particular disorder, or external risks such as exposure to a natural disaster, the experience of a major economic recession, or death of a parent.

Risk factors do not exert their effect in isolation but interact with other influences—and very often risk begets risk, as expressed in the notion of cumulative adversity (Dannefer,

2003; Gutman et al., 2019; Schoon et al., 2002; Schoon & Melis, 2019). Vice versa, advantages and privileges also tend to cumulate, leading to conditions of increasing polarization and inequality. Risks tend to co-occur and to accumulate over the life course, and the relationship between any single risk factor and subsequent outcomes tends to be weak. Usually many variables are involved in determining an outcome, and serious risk emanates from the accumulation of risk effects (Rutter, 2012).

In my own research I focus on how individuals and families cope with exposure to socioeconomic hardship and adversity at key transition points, such as entry into school or the transition to the labor market. Indicators of adversity, such as the experience of income poverty, tend to co-occur with other risks such as low parental education, parental worklessness, family instability, poor housing, and area deprivation (Schoon, Cheng, Jones, & Maughan, 2013; Schoon, Jones, Cheng, & Maughan, 2012; Schoon & Melis, 2019). Each of these factors shows independent risk effects (i.e., each factor is associated with indicators of child adjustment). Moreover, each additional risk factor is associated with a decrease in effective functioning. Generally, the higher the number of risks, the higher the levels of adjustment problems (Duckworth & Schoon, 2012; Evans, Li, & Whipple, 2013; Ng-Knight & Schoon, 2017). For example, children born into less privileged families show lower levels of academic attainment (Pensiero & Schoon, 2019; Schoon, 2010, 2020), self-confidence and educational achievement motivation (Duckworth & Schoon, 2012; Schoon, 2014) than their more privileged peers; they are leaving education earlier and are less likely to continue in higher education (Schoon & Lyons-Amos, 2017). These associations can be amplified in times of a global economic downturn, such as the 2008 Great Recession (Schoon & Bynner, 2017, 2019b, b; Schoon & Lyons-Amos, 2016).

The findings furthermore suggest that there is heterogeneity in risk effects. For example, while poverty is most strongly associated with cognitive development, family disruption is a more salient risk factor for socioemotional adjustment (Schoon, 2020; Schoon, Hope, Ross, & Duckworth, 2010). To gain a more comprehensive understanding of risk effects, it is thus necessary to study more than one outcome. Moreover, it is necessary to not only examine cumulative risk exposure but also to examine constellations of risk (i.e., if economic risk is accompanied by family risk or mental health problems; Schoon & Melis, 2019).

In addition, the timing and duration of risk exposure matter. For example, risk effects appear to be strongest during the preschool and early school years (Schoon et al., 2002; Schoon, Sacker, & Bartley, 2003), although there can also be concurrent and latency effects (Gutman, Joshi, & Schoon, 2019). Concurrent risk effects imply that current exposure to risk can add to pre-existing pressures, while latency effects imply that risk effects do not manifest immediately, but occur at a later stage. Risk experiences in early childhood can set up a vicious cycle of cumulating disadvantage across domains, although this does not necessarily have to be the case (Gutman et al., 2019; Schoon, 2006, 2012). Generally, persistent risk exposure is associated with stronger adverse effects than short-term or intermittent risk (Schoon, 2020). There might however also be habituation, or so-called steeling effects (Rutter, 1987; Schoon, 2014), indicating that individuals and families can learn to cope with persistent risk exposure (if the risks are not overpowering). It might however also be the case that individuals show resilience at one particular time point but not at another, pointing



to so-called sensitive or critical periods of development and the capacity for resilience can change over time.

## Developmental Processes

Developmental adaptation can be considered as the progressive and mutual accommodation between a developing individual and the changing properties of the immediate and wider sociocultural and ecological context. Development comprises evolving states of being, where outcomes or consequences are themselves precursors to subsequent experiences and events (Bronfenbrenner, 1979). Within resilience research, current levels of adaptation are viewed as the product of past experiences, which, in turn can become predictors for future developmental outcomes. The assumption of such hierarchical integrative processes asserts consistency and coherence of individual development as it implies that future developmental outcomes can be predicted from knowledge of earlier adaptation patterns (Sroufe, 1979). For example, a child performing poorly in primary school is often expected to also manifest problems in later educational settings (Heckman, 2006). Yet, the very definition of resilience predicates changes in trajectories and deviation from predicted relationships. A longitudinal study of children with language problems at school entry showed that the majority of children with early receptive language problems develop into competent readers by age 10 (Parsons, Schoon, Rush, & Law, 2011). Factors promoting positive language development included parental support and, more important, a good school environment. It might also be possible, for example, that school performance had become disrupted due to the experience of a family trauma or parental divorce coinciding with school entry, only to return to “normal” levels of adjustment after some time. To capture such dynamics in adjustment, it is necessary to understand why certain individuals succeed and maintain positive functioning or return to “normal” behavior despite exposure to a significant adversity. What is needed is a model of development that takes into account both consistency and change. Key aspects of such a developmental model of resilience comprise nonlinearity, hierarchical integration and differentiation, and the time and timing of events.

## Nonlinearity and Multidirectionality

Human development has been conceptualized by two contrasting positions, either describing development as a continuous growth process or as a discontinuous series of stages, where each stage requires a qualitative reorganization of the previous one (Gottlieb, 1992; Werner, 1957). While the continuous model assumes that development is predetermined from the outset, the discontinuous model recognizes the possibility of novel and emergent developmental patterns (Lerner, 1996). Both models have been used to describe the processes by which individual organisms develop from fertilization to adulthood. While some argue that the organism is preformed from the outset, persistent empirical evidence points to emergent properties through reciprocal interactions among all parts of the organism, including organism x environment co-actions. Within such an epigenetic, nonlinear, and staged model of development the emergence of new structures has been characterized as experience

dependent (i.e., as based on the transactions between a developing individual and a changing context; Sameroff, 2010).

Developmental stages can be used as a descriptive concept, focusing attention on the average achievements at a particular age (Erikson, 1959; Levinson, 1986), or as a theoretical concept, conceptualizing a developmental stage as a period of stability of functioning following the transition from a structurally different period of stability (Sameroff, 2010). There are reasons to be weary of staged process models when they imply an invariant sequence. Evidence from previous research suggests substantial variations among persons or among subgroups in the population regarding the ordering, timing, and duration of adjustment to changing developmental tasks. For example, studies examining the transition from adolescence to independent adulthood show that young people do not move through life in tandem, but follow their own time table (Schoon, Chen, Kneale, & Jager, 2012; Schoon & Lyons-Amos, 2016, 2017). Some leave education directly after the completion of secondary school, while others continue in higher education before entering the labor market. Some combine work and study, others even work, study, and start a family of their own. This diversity in role combinations and associated social and economic resources, in turn, shape the context in which development and resilience are embedded. It is also of note, that what sometimes looks like self-generated stages of adjustment or coping may represent a sequence determined by external demands and constraints (Lazarus & Folkman, 1984). For example, early school leaving is often associated with lack in socioeconomic resources and the need to earn a living (Schoon & Duckworth, 2010), but also problems within the school context, mental health problems, or the need to escape an abusive home environment (De Witte, Cabus, Thyssen, Groot, & van den Brink, 2013).

In this regard, the notions of equifinality and multifinality, derived from systems theory, are relevant to a better understanding of risk and resilience processes. Equifinality refers to varied pathways leading to similar outcomes, and multifinality assumes that a single component or risk factor may act differently depending on the organization of the system in which it operates (Bronfenbrenner, 1979; von Bertalanffy, 1968). As just pointed out, the reasons for early school leaving can be manifold, as are the resulting consequences. Not all young people leaving school early fail to achieve financial independence (Schoon & Duckworth, 2010) or life satisfaction (Schoon & Lyons-Amos, 2017). Changes in development are possible at many points across the life course, illustrating the potential diversity in ontogenetic outcome, regardless of similarity in the risks that are experienced (Lerner, 1996; Schoon, 2006, 2012, 2017).

## Hierarchical Integration and Differentiation

Developmental adaptation can be considered as the progressive and mutual accommodation between a developing individual and the changing properties of the immediate and wider sociocultural context (Bronfenbrenner, 1979). Functioning well in age salient developmental tasks during one developmental period establishes the foundation for doing well in future tasks (Masten, 2016), while failure to master a developmental task in early life can initiate a vicious cycle of maladjustment. Moreover, there is evidence of developmental cascades, where achievements or failures in adaptation spread over time, from one domain to another

(Blumenthal, Silbereisen, Pastorelli, & Castellani, 2015; Weeks et al., 2016), and potentially even across generations (Masten & Cicchetti, 2010). For example, according to the family stress model economic hardship can trigger stress in the family system and compromise the effectiveness of parenting and family relationships, which in turn can contribute to adjustment problems in children (Conger, Conger, & Martin, 2010). Any point in the life span can be understood as the consequence of past experience and as the launch pad for subsequent experiences and conditions, although developmental cascades can also alter the course of development. Lifelong development may involve processes that do not originate at conception, birth, or early childhood but in later periods. The nonlinear nature of human development is characterized by the reorganization and differentiation of behavior and experience, leading to the emergence of new structural and functional properties and competencies, which result as a consequence of ongoing interactions between the multiple structures or spheres of previously described influence.

## Time and Timing

Time is another essential category in conceptualizing resilience. The notion of time concerns individual aspects such as the physiological changes and processes of maturation that occur with aging, as well as aspects of the wider social context that are external to the individual. Time is often treated as synonymous with chronological age, providing a temporal frame of reference for the study of change. As children get older, they may react differently to environmental risks and may be more able to determine and evaluate how that change will influence them. As shown by Elder (1974) in his well-cited study “Children of the Great Depression,” the impact of economic hardship on young people’s adjustment can vary by context, age, and the timing of adverse experiences. For example, the effects of poverty and hardship experienced by families were less severe for young men who were already adolescents when the Great Depression hit, compared to those who were still children. The older boys were already involved in adult life tasks, such as helping out with the family economy and aspired to become autonomous adults, while younger boys were less hopeful, less self-directed, and less confident about their future. Likewise, in a more recent study of young people’s development in the 2008 Great Recession, the timing of the recession mattered (Schoon & Bynner, 2017, 2019b, 2019b). For example, while younger cohorts experienced increased difficulties in gaining entry to the labor market, older cohorts were at an increased risk of insecure and temporary employment. However, while the psychological well-being of adolescents appeared to be relatively unaffected by the Great Recession, older cohorts (aged 18–25) were more vulnerable to its psychological impact. The findings suggest a shift in the critical time window with younger children being possibly better protected by their families or institutional structures than young adults. I will come back to this point later.

Furthermore, factors that may confer resilience at one time point or for one outcome may increase vulnerability at another time or in another context. Thus, resilience cannot be fully explained by restricting analysis to specific life stages, such as mid-childhood, adolescence or old age. It is only by following individuals over time and in context that we can chart their developmental trajectories and pathways. Beyond individual maturation processes,

human lives are shaped by the particular social worlds and historical period encountered. For example, the birth year locates people in specific birth cohorts and, accordingly, to particular social changes. Young people making the transition to adulthood during the 1980s witnessed a very different sociocultural context than those coming of age today. There had been massive changes, including rapid technological advances, a changing labor market and an expanding educational system, many regional conflicts, mass migration, and economic and natural disasters. Also at the more proximal level of the family environment there have been massive changes, with increasing number of children being born to cohabiting or single parents or being exposed to experiences of family break-up and instability. Changes in the proximal and wider social context pose new situational demands and bring with them changing opportunities and obstacles, influencing lives and developmental trajectories, as for example through changing expectations regarding the timing of developmental transitions. It is thus important to replicate studies in changing socio-historical contexts to assess the generalizability of evidence.

For instance, since the 1970s the transition to adulthood has on aggregate become more prolonged due to extended education participation and delayed entry into employment and family formation (Schulenberg & Schoon, 2012). Extended transitions characterized by participation in higher education and subsequent employment are considered to be “optimal,” while early transitions (such as early school leaving or parenthood) have been associated with problems in establishing oneself in the labor market or making the transition to independent living (Sacker & Cable, 2010; Schoon et al, 2012). The timing of transitions is thus important in determining their meaning and implications. Yet, not all young people are able to participate in higher education, and there is persistent evidence to suggest that the preparation for adulthood has been elongated especially for those who can afford to invest in their education, while young people from less privileged backgrounds are leaving education earlier and are less likely to continue in higher education than their more privileged peers (Schoon & Lyons-Amos, 2016, 2017).

Moreover, evidence suggests that early transitions do not necessarily bring with them negative outcomes, and in certain circumstances early transitions can be beneficial for certain individuals (Booth, Rustenbach, & McHale, 2008), especially if they offer a fit to individual preferences and resources. For example, some young people succeed to make the transition to continuous employment and financial independence after leaving school early—either through learning on the job or participating in vocational training or further education—and they report high levels of satisfaction with their lives (Schoon & Lyons-Amos, 2017). Likewise, the effects of early parenthood on well-being depend on marital status as well as other circumstances in life (Nomaguchi & Milkie, 2003). Indeed, a considerable number of young people are able to turn around an initially problematic transition, such as early school leaving (Schoon & Duckworth, 2010) or early parenthood (Furstenberg, 2003; Schoon & Polek, 2011); avoid financial dependence; and lead a happy and satisfied life. Change for better or worse can occur across the entire life course and is shaped by continuous interactions between a developing individual and a changing context. Each transition can offer opportunities for change and renewal (Elder, 1998; Schoon, 2006, 2012, 2017).

## Critical Windows of Opportunity

Developmental timing also plays a key role in resilience-based theories and the effective design and implementation of interventions. Research on naturally occurring resilience suggests that there are critical windows of opportunity for change, especially when developmental processes, context, and available opportunities converge to provide an opening for change (Masten, 2014). In particular, early childhood and the preschool years have been identified as a period of high plasticity with great importance for the development of capabilities, laying the foundations for successful maturation (Masten, 2016). Another example is the transition to adulthood, when brain development, motivation, mentoring, training, the assumption of new social roles, and other opportunities can provide opportunities to support positive redirection of the life course (Steinberg, 2014). Life transitions into different environments can facilitate a process of readjustment, a transformation or potential turning point, allowing for new opportunities and a change in behavioral patterns or existing structures (Salmela-Aro, 2009). Regarding interventions this implies that support is needed during key transition phases, not just during the early years—a sustainable scaffolding that enables positive development across time.

## Resilience Processes

The socioecological developmental systems perspective assumes that different factors and processes can promote effective adaptation in the face of adversity. After more than 50 years of research on resilience, there has been a striking degree of consistency regarding a core set of factors associated with the manifestation of resilience across different studies, involving different populations of children, adolescents, and adults, in different risk situations and with different outcomes. These include characteristics of the individual, the family, and of the wider community (Masten, 2014). These factors are also understood as indicators of basic adaptive systems that protect human development under many different circumstances. In addition, previous empirical research has identified different resilience processes, linking experiences within and across systems. Within the socioecological developmental systems perspective these processes are conceptualized as aspects of developmental co-regulation, emphasizing the relational and interactive nature of resilience (Schoon, 2012, 2017). This approach implies a move away from a focus on individual characteristics, or personality traits, toward a better understanding of person  $\times$  environment interactions bringing about positive adaptation in the face of adversity. These processes comprise compensatory, protective, and steeling effects and can involve resilient integration, turning points (or transformations) and meaning-making. Furthermore, the developmental focus acknowledges that resilience is a process that extends over time and has to be continuously supported or facilitated.

## Compensatory Models

Compensatory models of resilience accounts for the availability of resources within the individual and the context that can counterbalance or neutralize the negative effects associated with risk exposure. As already mentioned, resource factors (or developmental assets) can

include characteristics of the individual (such as self-regulation, life planning, self-efficacy, or cognitive competences), characteristics of the family (such as effective parenting, family cohesion, family rules and routines, collaborative problem-solving), the wider social context (including effective schools and effective neighborhoods), and social policies (Lerner, Lerner, & Benson, 2011; Masten, 2014; Schoon, 2012, 2017). Regarding youth transitions, it is in particular the role of social institutions and structural arrangements that matter, including aspects of the education and training system, the labor market, and the welfare system that shape transition opportunities and can provide a buffer against unexpected events, such as a sudden economic downturn (Schoon & Bynner, 2019a, 2019b). These resource factors show an equally beneficial effect for those that are exposed and those who not exposed to adversity and show their beneficial effect in low- as well as high-risk conditions. According to a cumulative effect model (sometimes also referred to as main effects or additive effects model), the accumulation of assets or resources will outweigh the risks. Increasing the diversity, quality, or number of protective resources could theoretically offset the negative effects of risk or adversity or improve positive adjustment in general. Such compensatory processes are also referred to as “resource substitution,” where one resource can substitute for another or can fill the gap if the other is absent, and worst outcomes are predicted for those with low-levels of resources (Schoon & Lyons-Amos, 2016, 2017).

## Protective or Moderating Effect Models

Within a protective or moderating effect model of resilience, exposure to a protective factor or process should have beneficial effects only for those individuals who are exposed to the risk factor, but not benefit those who are not exposed (i.e., there should be an interactive relationship between the protective factor, the risk exposure, and the outcome; Rutter, 2006). For example, there is evidence to suggest variability in response to childhood maltreatment based on the gene encoding the neurotransmitter-metabolizing enzyme monoamine oxidase A (Rutter, 2013). Children with high levels of monoamine oxidase A are less likely to develop antisocial problems in response to maltreatment, suggesting that genotypes can moderate children’s sensitivity to environmental insults. Moreover, it has been argued that behavioral and morphological phenotype change can be instigated by change in developmental conditions, such as changes in rearing styles or shifts in the physical or psychosocial environment (Gottlieb, 1992; Kular & Kular, 2018; Turecki & Meaney, 2016).

However, resilience is not just a feature of gene  $\times$  environment interactions and adaptive response to adverse situations can be triggered by numerous other circumstances. For example, in a study examining processes promoting academic resilience in the face of socioeconomic adversity, parental involvement with the child’s education as well as social integration were identified as protective factors that were particularly important for children growing up in a high-risk environment, in addition to and above the influence of academic ability or parental education (Schoon, 2012, 2017). These resource factors facilitated the building of bridges between different systems (i.e. the family and the school system or between the individual and significant others in the neighborhood). More generally, within interactive, or moderating effect models of resilience protective factors show a buffering or ameliorative influence and are especially important if the risk level is high. Protective or

moderating influences may lead to a reduction of risk effects and prevent negative chain reactions, instigating a positive chain reaction or creating opportunities to experience self-efficacy (Rutter, 2006; Schoon, 2012, 2107).

## Challenge Models

The challenge model of resilience suggests that resistance to risk may come from exposure to low-level risk, or risk exposure within controlled circumstances rather than avoidance of risk altogether. Exposure to low-level risk experiences, or controlled risk exposure, may have beneficial or “steeling effects” (Rutter, 1987), providing a chance to practice problem-solving skills and to mobilize resources (Elder, 1999; Schoon, 2014; Seery, Holman, & Silver, 2010). The risk exposure must be challenging enough to stimulate a response, yet must not be overpowering. For example, a series of studies on the impact of the 2008 Great Recession on young people’s achievement orientation suggest that young people tend to hang on to their ambitions even in times of economic hardship (Schoon & Mortimer, 2017), unless socioeconomic conditions are overpowering (Schoon, 2014), or changing circumstances such as the availability of new employment opportunities require them to change the course of their behavior and associated aspirations (Schoon & Bynner, 2017). The crux of the challenge model is that moderate levels of risk exposure open up opportunities for experimentation and learning of how to overcome adversity or to transform existing conditions. From a developmental perspective, the challenge model can also be considered as a model of inoculation, preparing the developing person to overcome significant risks in the future (Rutter, 2012).

## Resilient Integration

To describe successful adaptation after a prolonged period of disruption or stress, the term *resilient integration* has been used (Kumpfer, 1999). The capacity for resilience is seen as developing over time, through the integration of constitutional and experiential factors in the context of a supportive environment (Oshri, Duprey, Kogan, Carlson, & Liu, 2018; Schoon, 2012). Certain attributes or circumstances that are generally associated with positive adjustment may not necessarily show immediate benefits, but may be predictive of positive adaptation later in life. Similar to the notion of sleeper effects, where beneficial effects are not detected until a period of time has elapsed, resilient integration requires protective attributes or circumstances to be stored up for later use. Moreover, developmental “reserve capacity” may not necessarily be utilized immediately but can be drawn upon when required (Baltes, 1987). For example, a study examining factors and processes involved in overcoming a potentially problematic transition such as early school leaving showed that in addition to cognitive competences, young people from a socioeconomically disadvantaged family background who actually enjoyed school and learning but had to leave education early to make a living, succeeded to maintain financial independence (i.e., they were not dependent on social benefits), and remained attached to the labor market nearly 20 years later (Schoon & Duckworth, 2010). They were also more likely to return to education later in their lives to obtain additional qualifications (Sacker & Schoon, 2007). These findings highlight the importance of building up positive attitudes and to support integration into institutions, as these factors can have long-term beneficial effects.

## Turning Points

Delayed recovery may also stem from positive experiences, or “turning point” experiences in later life (Elder, 1998; Rutter, 2006). Substantial and enduring change in life course development often occurs during transition periods, such as entry into school, work, or family formation. These events are characterized by the assumption of new social roles and change of context. For example, in a follow-up study of teenage delinquents growing up in low income areas in Boston, Laub and Sampson (2003) showed that the step into a supportive marriage can instigate a beneficial turning point effect. It is however not only just one factor, such as the effect from a secure intimate relationship, that made a difference. The step into marriage also involved the “knifing-off” of the past, and the benefits of a new extended family network and friendship groups, as well as the informal controls exerted by the spouses that prevented contact with the delinquent peer group. It is this complex mix of influences that contribute to positive adjustment in the face of adversity, which also was apparent in Elder’s (1974) study of young people growing up during the Great Depression of the 1920s. The evidence of turning points in human lives illustrates the potential for plasticity, which can occur across the entire lifespan, enabling individuals to turn around an initially problematic transition, such as early school leaving (Schoon & Duckworth, 2010), early parenthood (Schoon & Polek, 2011), leaving residential care (Schofield, Larsson, & Ward, 2017), or delinquency (Laub & Sampson, 2003). Increasing age imposes constraints on potential responsiveness and one’s ability to act upon the environment, yet there is persistent evidence of individual capability to meet and handle adversities and to maintain or regain levels of effective functioning even in old age (Charles & Carstensen, 2010; Staudinger, Marsiske, & Baltes, 1993).

## Meaning Making and Sense of Coherence

Individuals are not passively exposed to external risk experiences—they interpret and process the information, bringing order and meaning to a changing world, and produce a set of expectations about how experiences fit together. The power of meaning for human life in the face of overwhelming suffering has been described by Victor Frankl (1946/1984) in his account of daily life in a Nazi concentration camp. Frankl identified the “will to meaning” as the primary motivational force to sustain efforts to survive in horrific circumstances. The wish for meaning and coherence of what is going on in the world and one’s own, often contradictory experiences of the world, has also been conceptualized as “sense of coherence” (Antonovsky, 1987). For example, a study with a group of working class adults born in 1958, who participated in higher education in a context where most people from the same socioeconomic backgrounds did not, identified different therapeutic narratives that were used to come to terms with the ambivalence produced by social mobility (Franceschelli, Evans, & Schoon, 2016). These narratives reflect a general sense of resilience, which enabled respondents to overcome their disadvantaged start in life by drawing on the hardworking ethic apparent in working-class families. In another study Black Caribbean parents in London were studied to understand how they prepare their children for the challenges ahead—including anticipated discrimination (Franceschelli et al., 2017). Through the use of family case studies different narratives were identified, linking individual experiences to family and community histories, and by drawing on the struggles of a collective past, parents passed on a sense of



resilience and achievement motivation to their children. It has been argued that the cognitive restructuring involved in meaning-making requires considerable capacity for thought and reflection and is more likely to be important as people grow older (Masten & O'Dougherty Wright, 2009). However, as Ungar (2004) points out, when resilience is viewed through a constructionist lens the way individuals create meaning of their behavior and the context in which this takes place are key aspects of a resilient response at any age. Similarly, Rutter (1990) considers variations in cognitive processing and appraisal, leading to acceptance rather than denial of challenges, as a crucial protective mechanism.

## Conclusion and Outlook

The socioecological developmental systems approach to the study of resilience avoids simplistic individual-focused conceptualizations, which do not account for the wider social and ecological context in which the developing individual is embedded. It takes a holistic approach, considering the multidimensional forces and relationships between individuals, their families, their neighborhoods, and wider social and ecological context. It accounts for the multidimensionality of positive adjustment, requiring attention to multiple domains, and the recognition that resilience is socially and culturally contingent. It recognizes that risk factors cumulate over time and in context, making it difficult to pinpoint one single factor or causal mechanism. It highlights the importance of time and timing of effects, which have important implications for the design of developmentally appropriate and sustainable interventions. Change for better or worse can occur across the entire life course, suggesting that it is never too early or too late to intervene. In addition, the recognition that developmental processes are profoundly affected by the wider social context draws attention to the role of public policies and practices that influence the nature of the environment and define the “action field” in which individual development takes place. Providing clean air, safe drinking water and housing condition are basic requirements for families, children, and young people to thrive, as is the provision of effective health and childcare, education, and employment opportunities. There is not one major factor that enables individuals to cope with adversity. What is important is the combination of multiple and diverse influences that make a difference and social policy and structures that create opportunities and resources, optimizing the life chances for all.

The socioecological developmental systems approach provides a framework that is generic enough to identify distinct layers of influence and to conceptualize the processes interlinking them. These processes involve compensatory, protective, challenging, and transformative effects, as well as the role of “reserve capacities” and meaning-making. The focus is on cultivating the capacity to sustain development in the face of adversity and constant change (Schoon, 2006, 2012, 2017).

While previous studies have focused mainly on development within single layers, there is a need for more concerted synergies from different disciplines regarding the conceptualization and integration of knowledge in specifying a multisystemic approach for the study of resilience. A particular focus should be directed at the interactions between individual, social, and environmental conditions. Previous evidence suggests that noise pollution, air pollution, and lack of greenspace are associated with cognitive development and health of

children (Stansfeld & Clark, 2015; Sunyer et al., 2015) and adults. There is an increasing understanding of the associated epigenetic mechanisms by which exposure to pollutants mediates its negative effects (Godfrey, Costello, & Lillycrop, 2015), but less is known about how to translate findings into effective interventions that might involve changes in attitudes, in living conditions, policies to reduce exposure to harmful substances, and effective reinforcement and control. Within this context the notion of resilience could serve as a bridging concept and facilitate discussion of complex systems among experts from different disciplines, providing a platform for potentially innovative theoretical and methodological insights and approaches. The emphasis on improving conditions for all implies a distinct focus on normative expectations guiding public policies and power relations in the management of resources.

Moreover, there is a need for more longitudinal studies, moving away from single snapshots and short-term follow-up studies (often of highly selected samples) to gain a better understanding of how resilience emerges and how it can be sustained over time and in context. This requires good quality data and appropriate measures of risk and adaption, and of relevant process variables. The use of administrative data, such as information on health, education, and employment might be helpful, in particular in combination with linked geocodes enabling the inclusion of area specific information on socioeconomic and ecological resources and indicators of deprivation. In this connection, there are however issues of research ethics and limitation of access to be considered, as well as the availability of relevant background and process data.

There is potential in using “natural experiments,” that is, situations such as policy changes, economic boom or bust, cultural upheaval or natural disasters that create opportunities to observe continuity and change in behavior and adjustment. Such an approach is particularly effective if there is pre-existing data on patterns of adjustment across key domains, such as in ongoing cohort or panel data. Generally, the use of national representative longitudinal data would be advantageous, enabling the comparison of adjustment processes in different subgroups in the population or different local areas. Comparing evidence across different countries would bring additional insights into similarities and variations by sociocultural conditions and thus on the generalizability of findings. The availability of harmonized data, collected across different countries, would furthermore facilitate the task of obtaining comparable data across different contexts and outcomes.

In addition to improving the quality of the empirical database, there is also a need for mixed-method approaches, using qualitative case studies to gain better insights into the endogenous and social dynamics of the system. Aiming to understand the complex and dynamic nature of the social-ecological system requires the development and adoption of diverse theoretical and methodological approaches and openness to the perspectives of diverse interest groups.

## Key Messages

1. The idea of socioecological developmental systems is informed by general systems theory (Bertalanffy, 1968), conceptualizing living systems as a unified whole, where different levels of influence are interrelated and each level is characterized by self-activity and historicity.

2. Individual-level resilience is not a personality trait. It is a relational, dynamic, and multi-level process, linking the individual to a range of sociocultural, historical, and ecological influences and thereby sustaining effective functioning, recovery after an initial stress response, or transformation of ill-fitting conditions.
3. The socioecological developmental systems approach recognizes that the non-reductionist analysis of individual behavior requires the simultaneous consideration of several spheres of influence, thereby moving beyond simple cause-and-effect explanations of behavior. Moreover, it emphasizes the role of developmental processes, involving consistency and change in behavior, and the need to consider the importance of time and timing of events.
4. It is assumed that individuals and their environments are potentially malleable and mutually constitute each other through processes of co-regulation.
5. From an individual-level perspective, co-regulation can comprise a range of processes involving compensatory, protective, steeling, transformative effects, and meaning-making.

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