CONTENTS

1 ADULT DEVELOPMENT: CONCEPTS, HISTORY AND PARADIGMS

During a research interview, I asked Joe, age 68, whether he thought he had developed since he had become an adult. He recalled that in his early thirties he became more mature and responsible than he was as a younger man, particularly after the birth of his first child. He then said that his career seniority and income peaked in his fifties, a time when he was most recognised by others as being a 'success' and a 'man of influence'. He felt that his memory had declined slightly over the past few years, but he reckoned he was quicker at solving crosswords than he had ever been. Finally, he reflected that now, in his late sixties, he was much happier and at peace with the world than he was earlier in life. Retirement from full-time work had helped this, as his job had involved a lot of pressure and reputation management. Joe reflected that he thought all these changes were important developments that had occurred in his adult life.

Adulthood and *development* are two words that appear at first glance to be simple enough to define. Both are, in fact, surprisingly difficult to pin down. Given that this whole book hangs on their meanings, I start with a reconnaissance and critical evaluation of their varying definitions. This is followed by a brief history of adult development theory and research and then an overview of the biopsychosocial approach to studying development. Once all that is covered, we will have the basic foundations in place and so can move onto research methods used in adult development – the topic of Chapter 2.

Ways of defining adulthood

The legal definition of adulthood

Being an adult has a defined legal meaning. The law views an adult as a person who, by the fact of reaching a certain age, is able to make informed, autonomous decisions about what they do or refrain from doing. They are therefore seen to be *legally accountable* for those actions. The 'age of majority' is the official term for the age at which a person legally enters adulthood. Those who are below this age are correspondingly referred to as 'minors'. In most of the world's nations, the age of majority is 18. When a young person has reached the age of majority, parents are no longer legally responsible for them or held accountable for their actions.

Table 1.1 Minimum legal ages for sexual consent, cigarette purchase, alcohol purchase, driving a car, joining the army, marrying without parental consent, casino entry, and voting

Adult-limited activity	UK age limit	USA age limit
Having sex	16	16–18 (varies by state)
Purchasing cigarettes	18	18
Purchasing alcohol	18	21
Gaining a driving licence	17	16
Joining the army	18	17 (with parental consent) 18 (no parental consent)
Marriage with parental consent	16	15–16 (varies by state)
Marriage without parental consent	18 (except Scotland – 16)	18 (except Nebraska – 19 and Mississippi – 21)
Entering a casino	18	18–21 (varies by state)
Getting a loan from a bank	18	18
Getting a tattoo	18	16–18 (varies by state)
Voting in elections	18	18

The age of majority does not necessarily correspond to the legal age at which a person may engage in *specific* activities that are prohibited to children and permitted to adults, such as getting married, having sexual intercourse, purchasing and consuming alcohol, gambling, and driving a car. The ages at which these activities are permitted tend to cluster within a few years of the age of majority, as they are all considered to be dependent on adult responsibility and informed decision-making. Table 1.1 shows age limits for the UK and USA on a variety of child-prohibited activities. As you can see, all occur within the age range of 16 to 21, a period that is often referred to as the *transition to adulthood* (Levinson, 1986).

In the eyes of the law, children are considered to lack the capacity to imagine the future implications of their actions for themselves and others and therefore to know whether their actions may or may not lead to harm. An adult, by contrast, is considered capable of understanding the long-term *outcomes* and *implications* of their actions and therefore of being able to make informed decisions about which course of action to pursue. This means that they can avoid actions that might lead to harming themselves or others in the future. Correspondingly, activities that are restricted to minors but permitted to adults include those that have the potential for harm (such as smoking, having sex, gambling, driving, and drinking alcohol) or very long-term implications (such as getting married or getting a tattoo). Contractually binding obligations such as loans are also restricted to adults, as entering such contracts in an informed way entails an ability to foresee long-term outcomes and this foresight is viewed to be an adult capacity. Voting in political elections is also legally restricted to adults because of the assumption that children are not well placed to select between voting alternatives in a free and informed manner.

In summary, the legal definition of an adult is an autonomous citizen who has reached the age of majority and therefore can make informed decisions for themselves, be held responsible for those decisions, and participate in the contractual obligations of society.

In what circumstances are adult rights and responsibilities lost?

The only conditions under which the adult permissible activities in Table 1.1 are sometimes revoked are if a person (a) has been found guilty of committing a crime and placed in prison, (b) has been sectioned under the Mental Health Act, or (c) has dementia or age-related cognitive decline that disrupts their capacity for safe actions or informed consensual decisions.

In relation to prisoners, the extent to which they have adult rights is variable across activity and culture. For example, with regard to voting, the UK does not allow prisoners to vote, but in countries such as Spain, Sweden and Finland, all prisoners get to vote. In Germany, prisoners lose their vote only if their crime is against the state or against the democratic order (e.g., terrorist crimes).

In relation to dementia and cognitive decline, some elderly adults who experience severe cognitive degeneration or get advanced dementia can sadly no longer be treated as possessing adult rights and responsibilities. For example, if an elderly adult is judged to be no longer able to drive safely, they will have their licence revoked. In relation to the informed consensual decision-making that is a key capability of the adult mind, this is often judged to be lost in cases of dementia or cognitive decline, and other people, typically family members, must start to make decisions for them akin to the way that parents make decisions for their young children. Furthermore, if elderly adults become unable to wash or cook (or both), their living environment must be changed or tailored to ensure that they have access to food and care facilities. If they lose short-term memory as occurs in Alzheimer's disease, their residence may need to be locked so they don't get lost or into danger. So, for some, the journey of adulthood ends rather ignominiously in a return to a situation that resembles childhood. This condition of elderly dependency is becoming more common because of the increase in life expectancy over the past century – a fact that I discuss further in Chapter 6.

Personal and social definitions of adulthood

A person is legally an adult when they reach the age of majority, but they might not actually view themselves as an adult at age 18 and others might not either. Research has found that when young people between the ages of 18 and 25 are asked whether they consider themselves to be an adult, the most common answer is 'in some respects yes, but in some respects no' (Arnett, 1998). This finding alludes to the fact that adults in modern countries go through a stage of life during which they are legally considered to be an adult but are not yet occupying productive adult roles. Arnett (2000) refers to this in-between phase as *emerging adulthood*, which spans the period of life from the end of adolescence into the mid-twenties. It has some similarities to adolescence, insofar as it is an exploratory and non-committal period for many, but it is different because the young person has more independence from parents and has adult rights such as being able to drive. When asked about what it means to be an adult, individuals in the emerging adulthood phase mention various things that they have not yet acquired (Arnett, 2000; Lanz & Tagliabue, 2007; Lopez et al., 2005). These include the achievement of financial independence from parents, leaving education and gaining stable employment, a strong sense of personal responsibility, moving out of the parental home, marriage and parenthood. These markers of adulthood are

rarely reached by the age of 18 and are typically achieved after the age of 25 (Arnett, 1998, 2006a). For a selection of individual quotes from emerging adults on what it means to be an adult, see Box 1.1.

Box 1.1 Individual Voices

Personal meanings of being an adult

Lopez et al., (2005) interviewed 18 young people between the ages of 18 and 25 about their views on what it means to be an adult and what signifies entry to adulthood and collated their responses into common themes. Example quotes from the young people they spoke to are given next.

Responsibility

'I guess the biggest word that I relate with adulthood is responsibility ... I think being an adult means that, that you've learned your lessons and you're able to take care of yourself' (p. 17).

Independence from parents

'I'm at a point in my life where I'm tired of them [parents] helping me because I wanta be independent and I think that's another part of being an adult, being independent. Not to say you're gonna carry the weight of the world on your shoulders, but, you know, you're more prone as a child to ask your parents for something than you are as an adult' (p. 18).

Entry into workforce and career stability

'I feel like my career is the most important right now just because that's gonna probably lead the direction that my life is gonna go in. So I wanta make sure that I have a good career choice and that, you know, I'm happy with what I'm doing. If I'm not happy with my future job, then I probably won't be too happy with other aspects of my life' (p. 16).

Having and taking care of a family

'When I got married, that was one, and then when both my kids were born, that's when it really set in, where I can't do anything ... nothing I do is for myself anymore. You gotta think about others. You can't just go off and do what you wanta do, like I used to' (p. 17).

Personal definitions of adulthood such as those in Box 1.1 are shaped by social norms and these differ by ethnic group. For example, one study found that Latino parents of Los Angeles college students defined adulthood by event-related markers, including marriage and getting a job, whereas white parents defined adulthood more by financial and personal independence (Saetermoe, Beneli & Busch, 1999). Arnett and Galambos (2003) report that being in a committed long-term relationship is a signifier of adulthood for some ethnicities and nationalities more than others; 71 per cent of Argentines, 55 per cent of Israelis, 28 per cent of African-Americans and 14 per cent of white Americans see it as a mark of entry into adulthood. In some cultures that are defined by conflict, the transition to adulthood may involve rites of passage that relate to participation in the conflict. For example, Peteet (1994) has researched

perceptions of rites of passage into adulthood among Palestinian men and these are described in Box 1.2.

Box 1.2 Cross-Cultural Perspectives

Markers of adulthood for Palestinian men

Peteet's account of the transition to adulthood in Palestine is a reminder of how important gender is to the adult transition in many countries and also how rites of passage can be forged from adverse circumstances (Peteet, 1994). In Palestine, for a boy to make the transition to manhood, he must first learn to portray the appropriate traits of *adult masculinity*. These include overt expressions of fearlessness and assertiveness, such as through the defence of honour, reputation, kin and community from external aggression. Beatings or detentions from the Israeli military act as an overt demonstration of manhood and may actively be sought as proof of masculinity. 'Real men' gain respect and obedience when resisting submitting to the control of others. Importantly, manhood can be lost if one is not vigilant about displaying and protecting it.

There are two further marks of adult development that Peteet mentions: The first is personal control through sacrifice of one's own needs for others, which is a key demonstration of adulthood. The second is a quality referred to as 'aql', which is a combination of social common sense, rationality, judiciousness, prudence and wisdom. Males are typically assumed to begin acquiring 'aql' at 20 and to attain it fully around the age of 40. As a quality, it bears many similarities to the qualities that young people are expected to attain at the age of majority in Western countries (Peteet, 1994).

Defining adult development

'Development' is a concept that can be defined in various ways when related to adulthood. According to one definition, development refers to all enduring changes that occur during human life, both those that lead to gain *and* those that lead to loss (Baltes, Reese & Lipsitt, 1980; Magnusson, 1995; Uttal & Perlmutter, 1989). The term is used in the title of this book in this sense: as a general signifier for the totality of enduring changes in adulthood, whether positive, neutral or negative.

Another definition of development refers specifically to enduring changes that are considered positive or optimal – that is, changes that lead to a better status quo than previously achieved (Bronfenbrenner, 1979; Commons, 2002; Valsiner, 2000). This positive definition is often used in contrast to the term *ageing*, which refers to age-related declines that occur in adulthood. What criteria should be used to judge whether a person is changing in a way that is positive? This is an easier question to answer in relation to child development because optimal development has a very clear yearly timetable from ages 0 to 16, and essentially the optimal direction is towards becoming more like an adult. It is a harder question to answer for adults; what amounts to positive change? Here, five possible positive trajectories for adult development are described: (1) orthogenetic, (2) reproductive, (3) veridical-epistemic, (4)

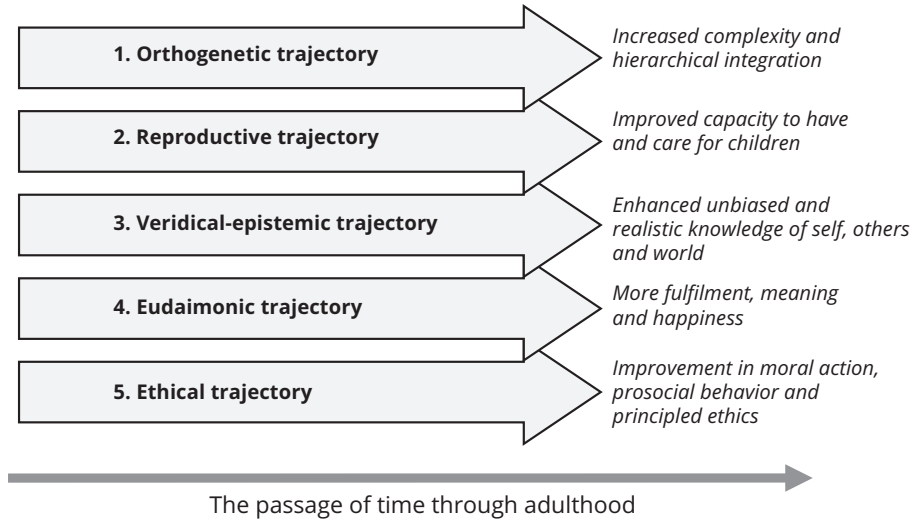

Figure 1.1

Five trajectories of positive adult development

eudaimonic and (5) ethical. Each one specifies a form of positive change through adulthood and each has something to contribute to an overall conception of what it means for adults to develop optimally. Figure 1.1 provides a visual illustration of these five and their corresponding ideals.

Five trajectories of positive adult development

1. *The orthogenetic trajectory: The journey towards complexity*

Orthogenetic development is change that brings about higher levels of integrated complexity within a system (Werner, 1940). This occurs by way of three interacting processes: (1) *differentiation* of internal forms within an organism, (2) *articulation* of these forms into definable and related parts, and (3) *integration* of those parts into systems. Think of an embryo growing: it develops into more and more different cells (differentiation) and these cells are then combined into organs (articulation) and all these organs are then coordinated together into systems such as the circulation and digestion systems (integration). The embryo becomes more and more complex as orthogenesis proceeds, leading to the development of the foetus and then a human infant. Orthogenesis can also be seen in child development, as children become more physically complex and develop increasingly complex cognitive understandings of the world (Werner, 1940) and more complex emotions (Banerjee, 1997; Lewis, 1990).

It has also been suggested that orthogenesis defines psychological development in adulthood through enhanced cognitive-affective and behavioural complexity and hierarchical integration (Erikson, 1968a; Kegan & Lahey, 2009; Valsiner, 2000). The benefit of an orthogenetic view of positive adult development is that complexity is measurable and does not require an interpretative value judgement. Second, if indeed increased complexity defines development at all stages of life, this is certainly a neat

solution to the question of what it means to develop in a positive and optimal way; it would mean that the very same mechanism of increasing hierarchical complexity underlies development in embryos, babies, children and adults.

The problem with orthogenesis as an ideal for adulthood, however, is that there may exist ways of changing in a valued or productive direction that involve a change towards simplicity rather than complexity or show no change in complexity. Furthermore, some theorists even suggest that systems have an optimal level of complexity and can become *too* complex (May, Sugihara & Levin, 2008). If a system becomes too complex, then it can become more prone to failure, as more complexity means more hierarchical coordination and integration and more mediating layers between levels. So, if there is a maximum level of complexity for adaptive functioning in human beings, more of it may not always be a good thing. This suggests that we may need to balance an orthogenetic trajectory for development with other ones.

2. *The reproductive trajectory: The journey of passing on your genes*

Through the process of natural selection, biological evolution operates to ensure that organisms that survive and reproduce in greater numbers are the winners in the 'survival of the fittest' whereas those that do not, die out. Evolutionary psychologists suggest that passing on our genes is programmed into us as *the* fundamental goal of living and development (e.g., Belsky, 1995). When viewed from an evolutionary perspective, this means that developmental progress in adulthood is manifest in the improved capacity to survive to reproductive age, acquire a mate, retain a mate, have children and engage in effective parenting (Kenrick et al., 2010). People who have more children and provide a safe and nurturing environment for their children to grow up are more highly developed from this evolutionary-reproductive viewpoint (Kenrick et al., 2010).

What makes a person more likely to reproduce? The motivational developmental theory of Heckhausen, Wrosch and Schulz (2010), which is discussed in Chapter 5, takes an evolutionary perspective and presents an answer to this question. It states that developmental success is indexed by how much a person can control their environment and thus change it to meet their needs or to eliminate threats and thus ensure their own survival and reproduction. In Chapter 12, an evolutionary perspective on love is taken by Sorokowski et al. (2017), who conclude that emotional intimacy between partners may not actually be helpful in reproductive success.

A problem with maintaining a purely reproductive view of optimal adult development is that a person may act in a way that benefits his or her own genetic legacy by having lots of children while being harmful to the environment or other people or being deluded about his or her own self-worth. To prevent the conclusion that quantity of offspring is the sole and ultimate benchmark of human development, it is important to counterbalance the idea of reproductive success with other enduring ideals that humans aim for beyond the act of reproduction; these can be termed the 'higher needs' of development (Maslow, 1968).

3. *The veridical-epistemic trajectory: The journey towards knowing*

The veridical-epistemic trajectory of adult development involves developing a more knowledgeable and accurate conception of oneself, others and the world. The word veridical means 'coinciding with reality'. The word epistemic means 'relating to knowledge'. Together, they mean 'knowledge that coincides with reality'. The capacity

to view oneself and the world in an unbiased and undistorted way has long been seen to be an indicator of maturity (Basseches, 2003; Maslow, 1998). To quote the writer Philip K. Dick, 'Reality is that which, when you stop believing in it, doesn't go away'. The veridical-epistemic path of development is coming to a clearer sense of what that reality is, and who you really are as a person, beyond the biases that may prevent you from seeing yourself clearly (Taylor, 1989).

Typically, children have more positive biases in their self-concept than adults do and this is due to self-serving biases that boost positive self-regard during this period of life when such regard is fragile (Mezulis et al., 2004). The gradual relinquishing of these biases is widely considered to be a positive development in adults (Taylor, 1989). A lack of false opinions about other people is also considered to be an important development of a mature adult mind; conversely, biased attitudes towards particular ethnic or socioeconomic groups on the basis of simplistic, prejudicial or stereotypical evaluations are a sign of immaturity (Allport, 1979).

Veridical development not only means observing oneself and the world in a more accurate way, it also involves a greater tendency to be *truthful*. Chapter 7 discusses *authenticity* as an ideal for personality development, which is a person's capacity to know him- or herself and express thoughts and feelings *truthfully* rather than hiding thoughts and feelings, prevaricating and pretending to be somebody else by putting on an act. This can also be seen as a form of veridical development.

A distorted or false view of oneself and the world not only is considered immature but also in extreme cases is considered to be indicative of mental illness. For example, false or distorted beliefs about self or world (delusions) and/or sensory perceptions that do not relate to the physical world (hallucinations) are considered to be symptoms of psychosis whereas grossly exaggerated positive self-concepts are indicative of narcissistic personality disorder (APA, 2000).

The difficulty with ascertaining whether development is proceeding along the veridical-epistemic trajectory is that people disagree on what is knowledge and on what is true or false. For example, in Chapter 10, I cover spiritual development, which is a controversial area because although spiritual knowledge is for some seen as potentially truthful (e.g., Robinson, 2018), for many atheists it is viewed as false and thus evidence of developmental regression or cognitive deficiency (e.g., Dawkins, 2007). Another difficulty with the veridical-epistemic direction to development is that there is evidence that accurate perception of reality may not be conducive to well-being; for example, the depressive realism hypothesis states that depressed people have been shown, on average, to have a more realistic view of their own importance, reputation and abilities than non-depressed people (Dobson & Franche, 1989; Pollard, 2016). So, developing an accurate and veridical knowledge of reality may not make you happy. It might, in fact, make you miserable. To counteract this view, the next trajectory suggests that positive adult development is all about an enhanced sense of well-being.

4. *The eudaimonic trajectory: The journey towards well-being*

Eudaimonia is a word that can be traced back to Aristotle; it means the pursuit of fulfilment and well-being through purpose and meaning. Aristotle suggested that it describes an ideal for all humans to aim towards in development, and psychologists have found that humans are indeed motivated towards happiness, personal growth, purpose and well-being (Ryff, 1995; Seligman, 2011). Hedonia is a word that also

goes back to Ancient Greece; it refers to well-being through pleasure, happiness and feeling good. It was promoted as the key to a well-lived life by the Epicurean school of Ancient Greek philosophy. Epicurus, the founder of this school, said: 'We must exercise ourselves in things which bring happiness, since, if that be present, we have everything, and if that be absent, all our actions are directed towards attaining it'.

Giving eudaimonia the status of a developmental trajectory suggests that we can judge how developed adults are by how fulfilled they are. Charlotte Bühler (1964), whose theory we encounter in Chapter 5, took a eudaimonic view, suggesting that *fulfilment* was the ultimate direction and benchmark of adult development:

> By development, we mean a succession of events which follows a certain order, forms a definite pattern, has direction and represents a whole. In the person's subjective experience, this ***direction*** is towards certain ***results*** … We suggest the concept of ***fulfilment*** as one which would cover any result to which a person might aspire (Bühler, 1964, p. 1).

In Chapter 4, we focus more intensively on the lifelong search for well-being in terms of its hedonic aspect – the pursuit of happiness. Ryff (1995) suggests that beyond mere happiness, eudaimonic well-being has six dimensions, all of which need to be pursued if optimal development is to be established. They are purpose in life, self-acceptance, environmental mastery, positive relationships, autonomy and personal growth. Of these, personal growth is rated most highly in young and middle-aged adults but less so by older adults (Ryff, 1989b). The relative balance of the six dimensions changes with age; therefore, eudaimonic development should be evaluated relative to a person's age and stage of life as well as to any fixed definitions of fulfilment or happiness (Ryff, 1995).

The difficulty of defining development as eudaimonic well-being is that one person may be fulfilled and happy despite having done or achieved little and having not lived an ethical life whereas another person may be less happy but be highly developed in a reproductive, virtuous or veridical sense. A quote that springs to mind here is from Thomas Edison, the inventor of the light bulb and much more. Edison said: 'Discontent is the first necessity of progress. Show me a thoroughly satisfied man, and I'll show you a failure' (Edison, 1968, p. 110). Clearly, Edison was not enamoured with placing fulfilment and satisfaction aloft as life's goals. He was more interested in a kind of restless progress, typified by his own life of endless inventions and achievements.

5. *The ethical trajectory: The journey towards virtue*

Virtue is defined by being a good or righteous person, and as a developmental ideal for adults, it has thousands of years of heritage. For example, over 2500 years ago, the Buddha said, 'Just as treasures are uncovered from the earth, so virtue appears from good deeds, and wisdom appears from a pure and peaceful mind. To walk safely through the maze of human life, one needs the light of wisdom and the guidance of virtue'. For an adult to develop along the ethical trajectory, they would become more concerned for others and more just and fair and take into account the well-being of a greater number of people and living things in their decision-making. A finding of direct relevance to this developmental trajectory is that virtue is central to lay

definitions of maturity and optimal functioning. When a sample of adults were asked open-ended interview questions about (a) what constitutes maturity/immaturity and (b) what defines an ideal person, the most frequent responses to these two questions emphasised virtue (Ryff, 1989a). The number one indicator of maturity was being *orientated towards others*, and immaturity was defined primarily as being *self-centred*, whereas the number one indicator of being an ideal person was being *caring*. Similarly, in a study that my colleagues and I conducted across four countries and that gathered data on adults who were particularly admired by younger adults, the quality that was admired above all was *care and generativity* (Robinson et al., 2015).

Theories of moral development and wisdom are covered in Chapters 8 and 9; these cover how and when virtuous thoughts and behaviours develop. The ethical trajectory of development is also explored in other parts of the book; for example, ideas such as 'self-actualisation' are discussed in Chapters 5 and 7, 'generativity' is discussed in Chapter 7, and the relationship of spirituality to ethics and prosocial behaviour is discussed in Chapter 10.

The problem with stating that optimal adult development tends in the direction of acting ethically is that conceptions of the common good and ethics differ across cultures and moral philosophies; hence, one person's virtue may be another person's vice. The difficulty in deciding what is developmentally virtuous and what is not is discussed in Chapters 8 and 9.

Three kinds of change in development

No matter which of the above five developmental trajectories one is referring to, changes over time can be thought of as being one of three kinds (Lerner & Kauffman, 1985; Lerner, 2001; Magnusson, 1995).

1. *Quantitative continuous change* involves steady increments in a measurable variable over time, such as a gradual slowing of reaction time with age. This kind of pattern may involve a gradual increase, decrease or curvilinear change.
2. *Quantitative discontinuous change* involves a sudden shift in amount or extent of a variable, such as a sudden increase in visual ability following an operation on cataracts.
3. *Qualitative discontinuous change* involves a change to a new state that is *different in kind* from what came before, such as a change from being employed to unemployed, from being single to being married, or from being able to have children to being post-menopausal.

The three kinds of change are illustrated in Figure 1.2. Both quantitative continuous and quantitative discontinuous can be illustrated by using a line graph, but qualitative discontinuous change requires the illustration of a discrete break between two separate phases.

Stability would at first glance appear to be the opposite of these kinds of change but that is not always the case. Surface stability may hide change at a deeper level. For example, very elderly adults tend to decline in certain cognitive capacities such as reaction time, so if an elderly person manages to maintain *stability* despite the biological

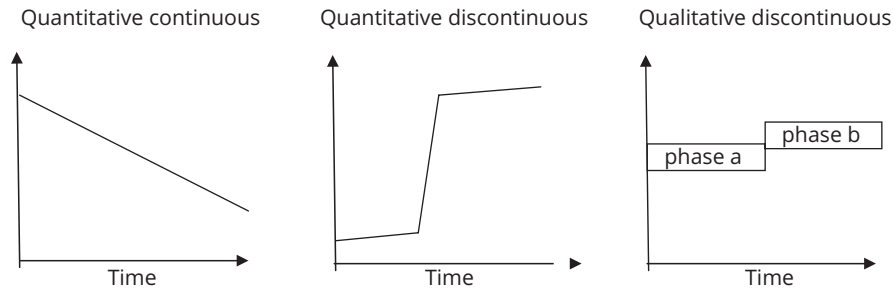

Figure 1.2

Three kinds of change in development

tendency for decline, this may be due to developing new strategies to compensate for their biological loss of capacity (Baltes, 1997; Salthouse, 1984). Stabilisation in the face of decline is a form of development, but it will not show up on a graph as growth; it will show up as a flat line. Therefore, it is important to remember that manifest stability may hide latent change.

A brief history of adult development theory and research

The study of adult development emerged in the first half of the twentieth century through the work of four pioneers in the 1920s and early 1930s: Edward Thorndike, Charlotte Bühler, G. Stanley Hall and Carl Jung.

Thorndike is most famous now for his work on animal learning and developing the Law of Effect, but he was also focused on adult learning as a driver of adult development. In two seminal works – *Adult Learning* (Thorndike et al., 1928) and *Adult Interests* (Thorndike, 1935) – he proposed that the potential for learning continues to increase up until a person is about 35. He found from a series of experimental studies that young adults are more effective learners than children, so he proposed that the ideal time within the lifespan to get a return on time spent learning is the 20–29 age range. Thorndike (1935) reported research into the motives and interests that drive learning across adulthood and it is here that his work becomes more explicitly developmental. For example, in one study, he asked older adults to retrospectively rate their level of interest in a variety of activities (including reading non-fiction, listening to music, outdoor sports, politics and travelling) across the age decades of 20–29, 30–39, 40–49, 50–59 and 60–69. He found that interests wax and wane across adulthood and concluded that adult education must appeal to age-relevant interests.

While Thorndike was working in the USA, another pioneer of adult development was developing complementary ideas in Germany. Charlotte Bühler (1933) published a pioneering analysis of 202 biographical studies of individuals considered to be outstanding in some way. She presented her conclusion that these individuals all showed a common pattern to their development: an integration and coherence in life as the result of a *unifying life goal*, which bound the disparate activities of life together into a meaningful whole. She also conducted research on young adults and found that young

adults rarely show this level of integration of life via a singular purpose or goal. Hence, she concluded that the passage of adult life is about cultivating clear intentionality through the discovery of, and pursuit of, a life goal.

G. Stanley Hall was a pioneering American psychologist who is now most famous for his work on adolescence. He also wrote a book entitled *Senescence: The Last Half of Life* (Hall, 1922). In the book, Hall presents a range of ideas that relate to ageing and dying. One pertinent chapter presents the results of a qualitative survey that Hall distributed to a sample of elderly adults. This was a very early forerunner of the qualitative methods that emerged much later in the twentieth century. His open-ended questions included the following: (a) Are you troubled by regrets? (b) Would you live your life over again? (c) Do you think more or less of dying and the hereafter? One can read his write-up of the findings in full via the full text of *Senescence* available for free at www.archive.org. See the Hall (1922) reference at the end of this book for the link.

Jung's key works on adult development were published around the same time as Thorndike's and Bühler's (Jung, 1933; Jung & Dell, 1940). In these works, he proposes that personality integration proceeds through adult life. The process of *individuation* is the active principle within the organism that seeks a functional level of unity and wholeness through combining the varied modules of the mind while balancing opposing drives and motives. As an example of Jung's approach to adult development, he proposed that in adolescence and then young adulthood, a *persona* is created that presents a front to the social world, behind which is hidden perceived socially unacceptable or shameful characteristics or memories (Robinson & Smith, 2010b). The midlife crisis involves the next step towards individuation: the demise of the young adult persona along with attempting to integrate the aspects of personality that have been chronically concealed from others or held out of conscious awareness (Hollis, 1993).

In sum, independently of each other, Hall, Thorndike, Bühler and Jung concluded that adults contained untapped potential for health, purpose and learning and that with the right support this potential could be released. However, their theoretical propositions were based on experimental, biographical and clinical research. What were ultimately needed to explore change and development across adulthood in a more direct and conclusive way were longitudinal studies.

Mid-twentieth century: The pioneering longitudinal studies of adult development

A set of influential longitudinal studies on adulthood commenced in the 1940s and 1950s. The Study of Adult Development was launched at Harvard from 1939 to 1944 with the aim of understanding social and emotional development in adult men. The initial sample consisted of 268 college-educated men. The participants were contacted every two years to complete questionnaires, every five years for health checks and every ten years for interviews. The study continued for 75 years. It has spawned influential psychosocial theories of adult development (e.g., Vaillant, 1977, 2002) as well as scores of research articles (e.g., Waldinger & Schulz, 2010).

In the late 1940s, three Berkeley-based longitudinal childhood studies – the Berkeley Growth Study, the Guidance Study and the Oakland Growth

Study – were extended into adulthood. These had commenced in 1928–1930 with samples of infants and young children. A wide range of data on physical, cognitive and socio-emotional development had been gathered on these children over repeated occasions up to the age of 18. When extended into adulthood, these studies led to one of the great longitudinal datasets of change across the lifespan. The study eventually included research on the children of the first sample, leading to the IGS, or Inter-Generational Studies. Hundreds of scientific papers have been produced on the basis of this dataset, and theories such as Baumrind's influential theory of parenting styles stem from her work with this longitudinal dataset (Baumrind, 1967).

In the 1950s, two more influential longitudinal studies of note were launched that framed the empirical study of adult development. K. Warner Schaie began the Seattle Longitudinal Study (SLS) in 1956 with the intention of exploring how cognitive abilities change over adult life (Schaie, 1996). The cognitive variables of *verbal meaning*, *space*, *reasoning*, *number* and *word fluency* were measured via seven-year intervals starting in 1956 and carried on up to 2005. At each interval, all participants from the previous phases were asked to participate again while a new group of people was also asked to participate. The SLS has provided important evidence of how different cognitive abilities have varying age-related profiles (Schaie, 1983) and also has contributed to theoretical debates (Hülür, Ram, Willis, Schaie & Gerstorf, 2016).

The final mid-twentieth-century longitudinal research that we mention here is the Mills Longitudinal Study, which commenced in 1958–1959 with a sample of 100 women from the final year of university at Mills College in Oakland. Data were collected from the women themselves as well as third parties, including parents. Personality, creativity, career success and relationships were assessed at repeated intervals. The study has run for over 30 years, has led to over 50 journal articles, and has provided key information about the antecedents of creativity, narcissism and positive emotion (e.g., Helson, 2001; Helson, Roberts & Agronick, 1995; Wink, 1992).

1960–1980: A blossoming of adult development theorising

From 1960 onwards, theorising on adult development evolved in a range of new directions. Erik Erikson's work in the 1960s and 1970s was central in this regard (Erikson, 1959, 1968a, 1968b). It drew liberally on the work of Jung (e.g., in referring to the concepts of individuation, identity crises and ego) and set out a parsimonious biopsychosocial stage-based framework that drew on sociology and biology too. The most widely discussed aspect of Erikson's theory is his proposed series of psychosocial stages, each of which is defined by a pair of opposites that exists in tension. Erikson was of the view that individuals are not placed at a single stage but oscillate between at least two. Indeed, the stages in Erikson's model can best be viewed more like heuristic tools for thinking about lifespan development than ontologically verifiable phenomena (Stevens, 2008).

Two theorists who continued to build on the Eriksonian psychosocial stage-based approach to theorising were Levinson (1978, 1986, 1996) and Gould (1972, 1978). Both of these researchers employed interview-based qualitative methods to model how a person moves through predictable age-linked psychosocial stages that are related

to normative roles and goals. An influential conceptual contribution from Levinson was the idea that adult development revolves around the building of, and then change of, the *life structure*. A life structure is the overall integrated pattern of a person's life at a given time. Levinson regarded adulthood as following a cyclical path through the building of a life structure followed by a stable period and then the demise of that life structure in order to construct one better adapted to the changing circumstances of ageing.

Another variant of stage-based theorising about adult development emerged in the 1970s and 1980s from a neo-Piagetian approach. Piaget laid down the challenge for other researchers in 1972 when he wrote an article entitled 'Intellectual Evolution from Adolescence to Adulthood', in which he proposed that future researchers must explore whether cognitive stages of development that appear in adults are not present in children and adults (Piaget, 1972). The most prominent neo-Piagetian theories of adult development to emerge at that time were Loevinger's stage theory of ego development (Loevinger, 1976), Kegan's theory of the evolving self (Kegan, 1982), Fowler's theory of faith development (Fowler, 1981), Fischer's theory of skill hierarchy (Fischer, 1980), and Common's model of hierarchical complexity (Commons, Richards and Kuhn, 1982).

At the same time that these various Eriksonian and Piagetian stage-based stepwise theories of adult development were developing through the 1960s, 1970s and early 1980s, life course theory became an influential force in sociology. It took a notably more pluralistic and contextualised approach to adult development, avoiding stepwise models in favour of exploring the relationship between life events, experiences and social context. It looked at the transitions and events through which adults pass, such as marriage, immigration, parenthood, divorce, retirement and bereavement, and how these are shaped by history, culture and society. Seminal works in this tradition are by Brim and Wheeler (1966), Riley (1979) and Elder (1974). One theorist whose work traversed psychology and sociology, and hence acted as a bridge between life course theory and adult development psychology, was Bernice Neugarten. Her work was influential in a range of ways, including its emphasis on the heterogeneity of developmental paths that can proceed through adulthood with successful outcomes, the role of chance in determining career, the emergence of the 'young old' (those in their 60s who were increasingly active and socially involved as a result of the extending of the lifespan), and the changing nature of grand-parenting (Neugarten & Weinstein, 1964; Neugarten, 1974, 1979).

In the 1980s, Neugarten's key precepts of the heterogeneity, interdisciplinarity and social embeddedness of adult development were further developed in the work of Baltes (1978, 1987). Baltes created an influential meta-theoretical framework for studying the lifespan that centred on (a) the multidirectionality and plasticity of development, (b) the contextualism and historical embeddedness of development, and (c) the important of integrating knowledge of development across disciplines. In Baltes's work, as with that of Erikson and many other theorists, a crucial feature of the understanding of adult development is the stated importance of focusing on biological, psychological and social levels of development to understand the changes that adults pass through as they age. This three-level approach is referred to as the biopsychosocial paradigm.

The biopsychosocial paradigm of development

The biopsychosocial paradigm states that to fully understand human development, one must take into account biological, psychological and social levels of analysis. There are many models of development that take this kind of biopsychosocial approach (e.g., Baltes et al., 1980; Chapman, Nakamura & Flores, 1999; Elder, 1994; Erikson, 1968a; Feldman & Fowler, 1997; Lerner & Kauffman, 1985; Magnusson, 1995; Neugarten & Datan, 1996; Wapner & Demick, 2002), all of which entail a commitment to the following four premises:

1. Human development happens concurrently at biological, psychological and social levels throughout life, and a full descriptive account of development must include all three levels.
2. Development at each of these three levels reciprocally influences the other two levels.
3. Biological, psychological and social descriptions and explanations are all as valid as each other, and no level has causal primacy over the other two.
4. Any aspect of human development is best described and explained in relation to the whole person and their social context as well as to their biological and cognitive-affective parts. This can be called a holistic or contextualist viewpoint and can be contrasted with the reductionist approach to development, which tends to focus solely on biological or mechanistic explanations (Lerner, 2001).

Erikson referred to this three-way focus on biology, psychology and social context as 'triple book-keeping' and considered it essential to understanding development (Stevens, 2008). The remainder of the chapter introduces each of the three components; first, I provide an overview of what is known about how the developing adult brain and genes shape, and are in return shaped by, development. Then I outline a framework for conceiving what the 'psych' bit of biopsychosocial means, and the chapter concludes with a model of social influences on individual development. The ensuing section assumes some knowledge of the brain, but in case you need a reminder, Figure 1.3 shows all parts of the brain that are mentioned subsequently.

The ever-changing brain: Adult neurogenesis and angionesis

The scientific understanding of the adult brain has been overturned over recent decades, and the news is good. Until 1990, it was widely accepted by scientists that neuron loss was inevitable and that no new neurons were formed in adulthood. This is now known to have been a mistaken view. In the 1990s, new ways of measuring neuron number, called 'stereological' techniques, showed that neuron decline in the hippocampus or the cerebral cortex is *not* a normal part of ageing after all. There is no reduction in neurons in the hippocampus with age and only a 10 per cent average reduction in cortical neuron across the age spectrum. Many other variables, including sex, are stronger predictors of neuron number than age (Morrison & Hof, 1997).

Furthermore, a revolutionary recent finding in neuroscience is that new neurons are constantly formed from stem cells in parts of the adult brain, a process called ***adult neurogenesis*** (Erikson et al., 1998; Lledo, Alonso & Grubb, 2006). The area

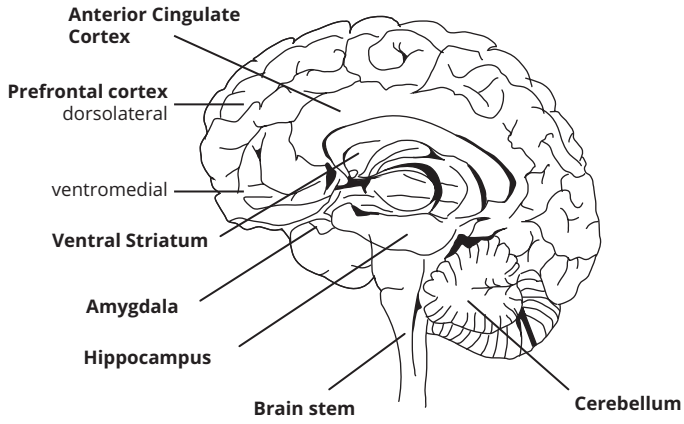

Figure 1.3

Key parts of the brain of relevance to adult development

of the brain that is most active in neurogenesis is the hippocampus, which is involved in learning and memory (Kemperman, Song & Gage, 2015). Research shows that thousands of new neurons are produced in the hippocampus every day (Lledo, Alonso & Grubb, 2006) and that this continues until over the age of 70 (Boldrini et al., 2018).

Studies with rats have provided important clues as to what promotes or inhibits adult neurogenesis. Providing rodents with an enriched environment (e.g., a cage with more learning opportunities, more social interaction and more space to live in) is correlated with more neurogenesis in the hippocampus (Fowler et al., 2002). Also, exercise helps; rats that have a running wheel in their cage have twice as many new hippocampal neurons as those that do not (Van Praag, Kempermann & Gage, 1999). Other studies have shown that stress leads to decreased neurogenesis in the hippocampus (Lucassen et al., 2015; Zhao, Deng & Gage 2008).

Neurogenesis has been implicated as a possible source of recovery from strokes. A stroke occurs when the blood supply to the brain is disturbed, leading to neurological damage and cell death. Within two to four weeks of the damage, neurogenesis of new cells is apparent within the site of the damage, particularly around blood vessels (Jin et al., 2006; Ohab et al., 2006). There is, in fact, a migration of 'neuroblasts' (infant neurons) from areas where neurogenesis is known to occur, such as the hippocampus, towards the site of the damage, travelling up to 4 mm (a long way for a neuroblast – the equivalent of a person walking 1.5 miles through syrup) (Ohab et al., 2006).

The brain's system of blood capillaries that feed it with oxygen and nutrients can also develop in adulthood; ***angiogenesis*** is the growth of new capillaries in the brain. Initially, it was believed that angiogenesis, like neuronal development, was limited to childhood, but it is now known that angiogenesis occurs during adulthood and can be induced by exposure to a complex physical and social environment (Black, Zelazny & Greenough, 1991) as well as by exercise (Black et al., 1990). Conversely, angiogenesis may decline if regular exercise is not taken (Boldrini et al., 2018).

Brain plasticity – How the brain is affected by experience, behaviour and social environment

We know that the brain is causally implicated in behaviour and conscious experience because if the brain is damaged, then mental and behavioural activity is correspondingly impaired, and drugs that operate on the brain change behaviour and conscious experience. What is less well grasped, however, is that behaviour and experience cause changes in the brain in return. This tendency of the brain to change its structure and function in response to experiences and the environment is called ***brain plasticity*** or ***neuroplasticity***. Box 1.3 provides an extraordinary example of such plasticity. An understanding of brain plasticity is central to a biopsychosocial approach to development because it provides evidence that the brain is not a unilateral cause of all things psychological, for it is itself shaped and sculpted by experience, behaviour and relationships (Perry & Szalavitz, 2006). Factors that affect the structure of the brain include diet, exercise, alcohol/drug consumption, stress and relationships.

Diet and the brain. What you eat and how much you eat changes your brain. Better diet quality relates to larger brain volume, more grey matter, more white matter and hippocampal volume (Croll et al., 2018). Evidence suggests that a low-calorie diet is associated with reduced risk of developing Alzheimer's disease and Parkinson's disease (Logroscino et al., 1996; Luchsinger, Tang, Shea & Mayeux, 2002) and that excessive calorie intake is a major risk factor for stroke (Bronner, Kanter & Manson, 1995). Research on rats has shown that a high-fat, high-sugar diet reduces synaptic functioning in the hippocampus (Molteni et al., 2002).

The body contains antioxidant systems to remove unwanted oxygenated molecules or prevent them from being formed. Vitamin E is an antioxidant that can protect learning and memory functioning and can slow the progression of Alzheimer's disease (Mattson, Chan & Duan, 2002). Dietary supplements of fruit and vegetables high in vitamin C, which is also an antioxidant, can reverse neuronal ageing (Galli et al., 2002; Joseph et al., 1999). Essential fatty acids (omega-3 and omega-6) are also essential for brain functioning (Haag, 2003). If these fatty acids are removed from the diet of rats, cognitive impairment and developmental disorder are observed (Wainwright, 2002).

Exercise and the brain. Exercise is good for the brain in all sorts of ways. It improves synaptic plasticity, enhances adult neurogenesis and boosts angiogenesis (van Praag, Kempermann & Gage, 1999). It can also reverse the effects of an unhealthy diet (Molteni, 2004). In elderly adults (60–79 years old), engaging in a programme of aerobic exercise is associated with increases in brain volume, in both grey and white matter regions, showing that brain growth is possible even in old age (Colcombe et al., 2006). Recent research has also shown that physical activity is related to greater functional brain connectivity, greater white matter integrity, more efficient brain activity, and superior executive and memory function (Erickson, Hillman & Kramer, 2015).

Social environment and the brain. Social environments in infancy and childhood come to be encoded in the structure of the brain. Findings from research with rats and mice show that disruptions in the mother–infant relationship result in

neuroendocrine, neurochemical and behavioural changes in the adult rat (Cirulli, Berry & Alleva, 2003). Social isolation in rats also reduces neurogenesis (Fowler et al., 2002) and delays the positive effects of exercise on neurogenesis (Stranahan, Khalil & Gould, 2006). Mice that are reared in a communal nest (a natural social environment for rodents) have higher levels of nerve growth factor in the brain (an important protein for neuronal health and growth) than those reared in standard laboratory conditions (Branchi et al., 2006).

The effect of stress on the brain. Stress and trauma can change the brain in a variety of ways. Mild and short-term stress can be good for the brain (McEwen, 1999), but prolonged exposure to stressors leads to sustained production of stress hormones in the kidneys and some of these, called glutocorticoids, are damaging to the brain if produced for too long (Sapolsky, 1999). The most well-known glutocorticoid is *cortisol*. It is essential for a variety of important bodily functions, but it inhibits glucose uptake by cells, and if it is produced in excessive amounts, it can cause neural degeneration, disruption of synaptic plasticity, atrophy of dendrites, and even neuron death (Sapolsky, 1999; Uno et al., 1989).

The hippocampus is one area of the brain that is particularly prone to stress-related damage and atrophy. Lupien et al. (1998) found that humans with prolonged elevated cortisol levels have a reduced hippocampal volume and showed deficits in memory tasks and that chronic stress causes shortening and de-branching of dendrites in the hippocampus and suppresses neurogenesis (Bremner, 1999; McEwen, 2000). Sufferers of post-traumatic stress disorder (PTSD) have been found to have chronically raised cortisol levels, and brain scans have shown that they have deficits on measures of hippocampal function and reduced hippocampal volume, relative to adults without PTSD (Bremner, 1999).

Effect of drugs and alcohol on the brain. The plasticity of the brain is bad news if a person engages in the excessive consumption of neurotoxic substances. Alcoholism increases the shrinkage of the cerebral cortex, the limbic system, the hypothalamus and the cerebellum (Lishman, 1990; Sullivan et al., 2000). The frontal lobes are particularly vulnerable to alcohol-induced atrophy (Pfefferbaum et al., 1997). Other drugs are less well researched in relation to brain function, but a 2004 study showed that methamphetamine abusers show severe atrophy in the hippocampus (Thompson et al., 2004).

Box 1.3 Alternative Perspectives

A story of extreme brain plasticity: The woman with half a brain

In his book *The Brain that Changes Itself* (2008), the psychiatrist Norman Doidge has collated case studies that illustrate the power of neuroplasticity. Among these is the case of Michelle Mack. Owing to an unknown problem encountered by her mother during pregnancy, Michelle was born with no left hemisphere in her brain. In the first few years of her life, she was subject to numerous tests to ascertain what was wrong with her, as she showed a variety of cognitive deficits

and difficulties controlling the right side of her body. However, she survived and by the time she reached adulthood, her development had proceeded astonishingly well. In her mid-thirties, when Doidge interviewed her, she was living a relatively normal life; she had a part-time job and she could hold normal conversations, laugh at jokes and be an engaged member of her local church. This provides powerful evidence of the ability of the brain to adapt to extreme environmental trauma; in this case, the absence of an entire cerebral hemisphere could be managed because of the plasticity of the brain.

Genetic plasticity: The effects of behaviour and environment on gene expression

Genes are not separate from biopsychosocial influences; what we do and the environments we are in change how our genes are expressed. The processes by which experience and environments affect genes are referred to as *developmental epigenetics* (Gluckman et al., 2009). Epigenetic mechanisms can also refer to processes by which environmental events or behaviours lead to changes in genetic expression that are inherited by offspring; for more on this, read Pembrey et al. (2006).

In order to understand genetic plasticity and developmental epigenetics, a few words on the basics of cellular genetics are necessary. In every cell in your body is an identical DNA genome, wound tightly into 23 chromosomes. For DNA to instruct physical development, it must be unwound and turned into proteins, which in turn become the physical structures of the body. To achieve this process, DNA from a cell nucleus is unwound and *transcribed* into a molecule called mRNA, which is then *transported* out of the nucleus into the cell body, where it is *translated* into proteins by small structures called ribosomes. These three processes of transcription, transportation and translation are influenced by a host of factors, including ones that have their origin in behaviour and environment. One process that turns genes on and off, and thus alters the transcription process, is the 'methylation' of DNA, which involves adding a molecule called a methyl group to a DNA sequence in such a way that the DNA is turned off or on.

Gilbert Gottlieb (1991, 1998) developed a theoretical model of epigenetic influences on development, termed ***probabilistic epigenesis***. In this model, there is regulation of genetic expression by neural, behavioural, physical environment and social environment factors. Because environments are not perfectly predictable, this process is not predetermined but is *probabilistic* and therefore we can never talk with complete certainty about how a person's development will progress in the future, as there are always unknowns in the equation. In the model, four levels of development are viewed as being reciprocally linked, by way of two-way influences, as illustrated in Figure 1.4. Each pair of up-down arrows in the diagram is termed a *co-action*. A co-action is what occurs when two things reciprocally influence each other without one being the cause and the other being the effect. To illustrate a co-action, imagine two people shaking hands – which person is the cause and which person is the effect? It makes no sense to say, for both are influencing each other in a co-action. Co-actions are at the heart of biopsychosocial theorising, for they help to account for how genes shape brains and environments and how environments and brains then shape genetic expression in return. It is all reciprocal.

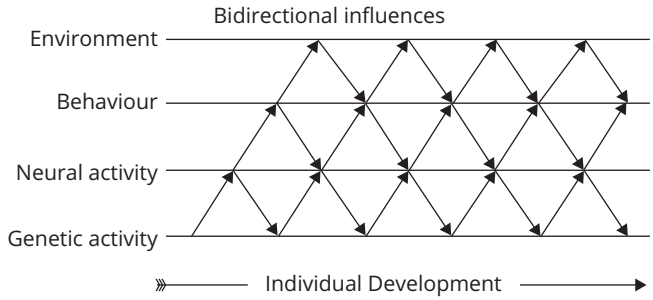

Figure 1.4

Gottlieb's scheme showing four mutually interacting levels of development, between which there are reciprocal influences (also called co-actions)

Source: Gottlieb (1991, p. 6). Copyright © American Psychological Association. Reprinted with permission.

There is evidence to support the effects of environment on genetic expression from research on a variety of species. In turtles, the temperature at which an egg is incubated influences which sex the animal becomes, showing that an environmental factor has turned some genes on, and others off, to develop male or female sexual characteristics (Wibbels, Bull & Crews, 1991). In hamsters, day length and testosterone levels influence DNA expression in the brain (Bittman et al., 1999). In rats and cats, various forms of environmental stimulation and stress influence how DNA is synthesised into proteins in the nervous system (Gottlieb, 1998), whereas in humans, examination stress affects DNA expression in immune cells (Glaser et al., 1990). Research linking epigenetics and brain imaging is now producing important findings suggesting that epigenetics relates to brain function and hence to cognition, emotion and behaviour. One study demonstrated that individual differences in the methylation of a serotonin transporter gene (*SLC6A4*) account for around 10 per cent of variability in threat-related amygdala activity (Nikolova & Hariri, 2015). Other studies have shown that methylation of this same gene differs as a function of life stress or early trauma (Nikolova & Hariri, 2015).

In summary, it is now well supported by research that genes lead to different phenotypes depending on information coming from outside the cell and even from outside the organism. According to Gottlieb (1998), this means that nothing in development is hardwired; development emerges from a combination of reciprocal influences at the genetic, organismic and environmental levels. This has empowering implications, for it says that how your genes express themselves in the structures of your body is, to a degree, under your control. It also means that if you don't look after yourself, you can undermine your adult development.

The psychological level of analysis: Wilber's Four-Quadrant Model

To understand the biopsychosocial paradigm, a clear sense of how the psychological level relates to biological and social levels is essential. Ken Wilber's Four-Quadrant model of development provides one effective way of construing their relation. In the model, the developing human being (or any other developing organism) can be viewed through four quadrants, as illustrated in Figure 1.5. These quadrants are formed by crossing two categorical variables: exterior/interior and individual/collective.

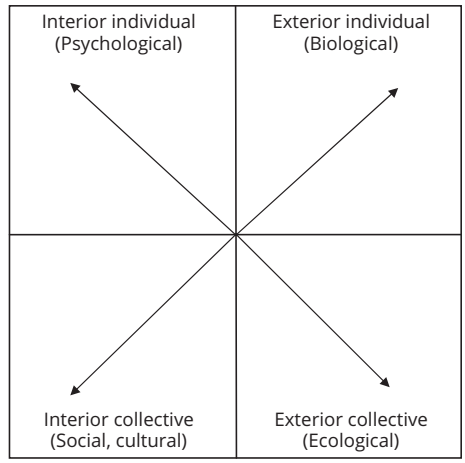

Figure 1.5

A four-quadrant model of development

Source: Based on Wilber (2000a).

The top right quadrant is the ***biological*** perspective; from here, the person is seen as an object composed of physical organs and organic matter. The top left quadrant is the ***psychological*** perspective, which views the individual person as a conscious agent with intentions, behaviours, feelings and thoughts. The bottom left quadrant is the ***social*** perspective, which views a person as *part* of a social group or social context, and the bottom right quadrant is the ***ecological*** perspective, which views the human being as part of the physical world and as part of surrounding ecosystems. This helps us to see how the psychological perspective fits in; it views the human being as a conscious individual with an inner life and intentions, who is simultaneously a biological being and part of social and ecological systems. Therefore, psychology, while maintaining its distinguishable features, should constantly interact with biology, sociology and ecology to glean insights from the disciplines that specialise in the other three quadrants. Wilber suggests that maintaining a focus on all four quadrants marks an *integral* perspective (Wilber, 1997, 2000a, 2000b).

Social systems and human development

Uri Bronfenbrenner (1979, 1994) proposed a biopsychosocial theory of how different social environments shape and sustain human development. To use Wilber's terminology, it relates to the 'lower left quadrant' of development. The theory describes how social systems fit within each other like a set of Russian dolls; large social systems such as a nation-state are composed of smaller communities, which in turn are composed of social groups, organisations and families. Bronfenbrenner's aim was to create a theory that distinguished between these different levels of social system to provide an alternative to referring to 'the environment' as a singular entity. The model proposes that social systems influencing the developing human being can be arranged by their size, from largest to smallest:

1. *The microsystem* – the pattern of activities, roles, and interpersonal relations experienced by the developing person on a day-to-day basis.

2. *The mesosystem* – all the settings in which the developing person actively participates and all the people they interact with.
3. *Exosystems* – the various systems that the person does not participate in but that affect them and their development, such as a partner's workplace or an elderly parent's care home.
4. *The macrosystem* – the cultural system of common rituals, laws, conventions and customs in which a person develops.

An example of the macrosystem shaping development is the phenomenon of 'age-grading timetables'. Bernice Neugarten, whose work spanned both psychology and sociology, found that cultures have expectations for how and when adult development milestones should be reached (Neugarten, 1996). Using these culturally created age-grading systems, individuals can self-appraise whether they are 'early', 'on-time' or 'late' in their work-life and family achievements:

> 'Every society has a system of social expectations regarding age-appropriate behaviour, and these expectations are internalized as the individual grows up and grows old, and as he moves from one age stratum to the next. There is a time when he is expected to go to work, to marry, a time to raise children, a time to retire, even a time to grow sick and to die' (Neugarten & Datan, 1996, p. 102).

Timing through such key life milestones in line with a culture or subculture's norms is a macrosystemic influence on the course of adult life (Neugarten, 1996; Neugarten & Datan, 1996). Mesosystem and microsystem phenomena include romantic relationships, marriage, family, children and friendships. These are covered in Chapter 11 on social relationships.

Adulthood is a time of never-ending psychological and behavioural change, partially because of the major alterations that occur in social environment over its course (Bronfenbrenner, 1994). The formative role of environments on human development gave Bronfenbrenner cause for optimism, for it means that there are higher, wiser levels of human development that have so far been unrealised, which may be unlocked by improvements in technology, education and community (Bronfenbrenner, 1979).

More recently, an integrative model of human development has been proposed by Sameroff (2010); the model is based on the original Bronfenbrenner model of nested systems but also refers to the biological and psychological twin nature of the individual at the centre of the various social systems. Figure 1.6 represents the key structures of the theory. At the centre is the person, who is conceived as a *biopsychological self-regulating system* composed of biological and psychological parts. This self-regulating person is embedded in, and influenced by, social systems, including parents, family, peers, community and geopolitical environment. The overall complex of developmental systems is termed the *biopsychosocial ecological system*.

Part of a biopsychosocial approach is accepting that historical events affect the course of individual lives. Bronfenbrenner referred to this as the 'chronosystem' of development (Sameroff, 2010). Baltes, Reese and Lipsitt (1980) referred to it as *history-graded influences*. Box 1.4 describes Glen Elder's research on the effects of the Great Depression of the 1930s on childhood and adulthood.

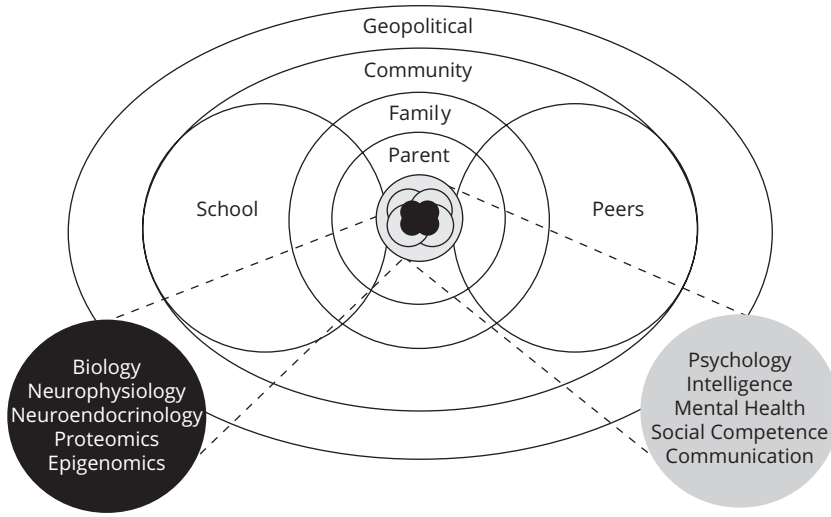

Figure 1.6

The biopsychosocial ecological system – developing biological and psychological systems embedded in multiple social systems

Source: Sameroff (2010, p. 18). Copyright © John Wiley & Sons. Reproduced with permission.

Box 1.4 Alternative Perspectives

The influence of the Great Depression on individual development

A well-known example of the influence of history on human development is sociologist Glen Elder's research on the effects of the Great Depression in the 1930s (Elder Jr., 1994, 1998). He looked at data from several longitudinal studies that commenced before the Great Depression and found that as this historical event unfolded, there was a cascade of effects down to the individual level. The loss of jobs and income that this event caused led to individual and marital stress and increased irritability and anger in fathers. This in turn reduced the effectiveness of parenting, leading to difficulties with child adjustment. Correspondingly, young children during the 1930s were more adversely affected in the long-term than adolescents (Elder Jr., 1998).

The research raises some key questions about the science of adult development. It suggests that unlike in the natural sciences where natural laws do not change appreciably over time, in psychological development what is true at one time may not be true half a century later. Therefore, adult development theory must be continually revisited, and research findings repeatedly tested, to establish whether they still hold. We will come across other examples of history shaping development at various points later in the book, such as in the historical changes to the nature of retirement (Chapter 13) and changes in the experience of bereavement over the past century (Chapter 14).

The social construction of ageing and the hidden influence of capitalism

One paradigm that focuses on the social level of analysis, and how it can affect the process of doing science and applying knowledge, is the social constructionist paradigm. It emphasises how the language and ideas that are used to refer to phenomena like adult development and ageing are themselves forged in a social and cultural environment and, given that knowledge is a kind of power, can be used to control or subdue (Powell & Hendricks, 2009). This means that theories and constructs, and the way we comprehend these through language, may contain hidden assumptions that reflect the fundamental values of our culture. For example, Robbins (2005) has discussed how the culture of *capitalism* infuses much of our contemporary academic discourse. A capitalistic culture is one that is devoted principally to the production and sale of commodities and services, for the growth of profit, wages and goods. The aim is continual accumulation of these as individuals and as a collective.

How could it be argued that a culture of capitalism influences our approach to ageing? As one example, some argue that a cultural shift over the past half century towards *institutionalised care* of the elderly, and the scientific literature around it, reflects capitalist values. In past centuries, older adults who were too frail to work would continue to live with their extended family and provide contributions within the home environment such as cooking, childcare and more or be cared for within that environment. However, this traditional way of living has two problems within a capitalist culture. First, it hinders the capacity of adult children of elderly adults to be economically productive, as one adult (usually female) is required to be home to care for their elderly parents. Second, it meant that the elderly adults provide little opportunity for profit-making.

Since the 1960s, an increasing number of elderly adults have moved into residential care homes, nursing homes or supported-living environments. This societal shift fits with capitalist culture as it means that working-age adults do not have to look after their parents and so can continue to work and be economically productive. Second, it means that elderly adults remain a powerful source of profit generation for private providers of care homes and nursing homes. There certainly is a lot of money involved in the care market; in the UK in 2017–2018, the average cost for a residential care home was £32,344 a year and for a nursing home was £44,512 a year (Laing Buisson, 2017). It is no accident that Duncan Bannatyne, one of the multi-millionaire capitalist entrepreneurs who features on the TV show *Dragons Den* in the UK, made his millions from building and running care homes and nursing homes for the elderly.

It has also been argued that theories of ageing may subtly reflect capitalist culture. Fries Radar (1979) argued that the standard view of human development in our time is one that adheres to a *fixed design* through age-based expectations and determinations. She specifically refers to those life-stage theories that posit a universal sequence of tasks or developmental activities for different age groups and how these may be cultural and social constructions. Such an approach to development implies that people of the same age can be treated in uniform ways, which in turn facilitates maximum efficiency and economic productivity. In her words:

> 'In our culture, people labeled as "children" are expected to play and to fulfill the impulsive needs of human beings. "Adolescents" are to explore different roles and to continue playing. The "adult" usually has the chance to work and meet the productive and nurturing needs of human beings. And the "old" are supposed to rest, and are given more opportunity to fulfill the contemplative human need. On the other hand, children and adolescents are constrained from contributing to their community, caring for others, or actively meeting sexual needs. The adult rarely finds time or release from worry enough to play and contemplate, and the older American finds few opportunities to develop intimacy, enhance generativity, or ensure economic security. Thus, childhood, adolescence, adulthood and old age are shaped by our economic, political, religious, educational and family lives' (Fries Radar, 1979, pp. 644–645).

In sum, the social constructionist approach asks us to critically consider how ideas and practices relating to adulthood may be constructed around invisible cultural assumptions of control, consumption, profit or power. It reminds us that complex constructs such as ageing have meanings to the extent that a group of people agree what those meanings are. It is an important part of the social level of analysis within a biopsychosocial framework and, while lending a critical perspective on biological and psychological levels of enquiry and analysis, should not negate their importance (Meloni, 2014).

Concluding comments

Now you have the basic foundations for the remainder of the book. Hopefully, you have grasped that being an adult not only has a legal meaning but also has personal and social meanings too; a person may be legally an adult at 18, but it may be another ten years before they *feel* like an adult. Furthermore, development in adulthood can happen in all kinds of positive and negative ways, and the positive ways (such as becoming happier, more virtuous, more adaptive, more complex and more knowledgeable) may conflict with each other. This means that change in adult life requires compromise and balance.

Development is something that occurs on biological, psychological and social levels and these three levels are bound together interdependently; what happens on one level leads to change in the other two, and vice versa, because of reciprocal influences. Our biology influences how we communicate and how we acquire knowledge; conversely, the social discourses we devise subtly influence how we understand our biology. I encourage you to keep this issue of reciprocal influence between levels in mind when reading the rest of this book; it is easy to forget when reading research papers since traditional psychological research methods such as experiments are aimed at establishing linear causality, when, in fact, development is much more like a tug of war than a chain reaction.

? QUESTIONS FOR YOU TO REFLECT ON

- **Have a look at the list of activities in Table 1.1. What do you think these activities have in common that make them prohibited to children, and what does this say about being an adult?**
- **It seems that human beings are taking longer and longer to grow up and leave home. Why do you think this is so?**
- **What does being an adult mean to you? Ask your friends and see whether they agree.**
- **In what ways would you ideally like to change as you grow older? Whatever your answer is – this is what positive development means to you.**
- **Think of a major transition in adult life such as (a) becoming a parent, (b) going through menopause or (c) moving into a nursing home in old age and try to think of the biological, psychological and social challenges that are involved in it.**
  - **Find a recent media article about the elderly. What cultural assumptions can you see being expressed within the article?**

Summary points

- Legal adulthood commences when a person reaches the 'age of majority', at which point they are considered autonomous and responsible citizens who can control their actions and consider the implications of them. Within a few years of the legal onset of adulthood, a person is allowed to smoke, drink, gamble, have sexual intercourse, get married, vote and get a mortgage. All of these activities are precluded to children because adult capacities of forethought and impulse control are necessary for their safe use.
- Personal definitions of adulthood typically include common criteria such as financial independence, moving out of the parental home, having a responsible attitude, desisting from adolescent risk behaviours, and becoming a parent. Emerging adulthood is a period of life during which individuals often consider themselves part-adult and part-adolescent.
- Development can be defined neutrally or progressively. The neutral definition is any enduring change that leads to loss or gain. The progressive definition is any change that leads to an improvement in functioning over time, according to some criterion that defines what 'improvement' means.

- Progressive development can be called positive development or optimal development. It involves change in a direction towards an ideal. Various ideals for adult functioning can be conceived, of which five of the most important are the orthogenetic direction (increased complexity), the eudaimonic direction (towards increased well-being), the veridical direction (towards increased truth and knowledge), the virtuous direction (towards improved moral character) and the evolutionary direction (towards improved probability of survival and reproduction).
- Developmental change can be quantitative continuous (a gradual change in a measurable variable), quantitative discontinuous (a sudden leap in a measurable variable) and qualitative discontinuous (a change from one state to a different state that is not different in amount but in kind). All three of these forms of change can be assessed in developmental research.
- The biopsychosocial paradigm views development as occurring concurrently at biological, psychological and social levels throughout life and holds that development at each of these three levels reciprocally influences the other two levels by way of 'co-actions'.
- Biological, psychological and social descriptions and explanations are all as valid as each other, and no level has causal primacy over the other two.
- The brain shapes behaviour and is also shaped *by* behaviour in return. The capacity of the brain to adapt to behaviour and the environment is called *neuroplasticity*. Diet, stress, social environments and toxins can all change the structure and functional localisation of the brain.
- Genetic expression is altered by behaviour and environments. A model that describes how this occurs is the model of *probabilistic epigenesis*, which states that genes, brain, behaviour and environment shape one another reciprocally.
- The psychological level of analysis is that which takes into account individual internal experiences (i.e., intentions and subjectivity). Wilber's four-quadrant model provides a framework for conceiving how that relates to biological, social and ecological levels of analysis.
- Bronfenbrenner's model of social influences on development conceives of multiple levels of social systems in which a developing person is embedded: *the microsystem* – the daily pattern of social activities; the *mesosystem* – key social settings (e.g., home and work environments); *exosystems* – the various influencing social systems that the person does not actively participate in, and the *macrosystem* – the cultural milieu that a person lives in.
- Development is shaped by historical changes, as illustrated by Elder's research on the effects of the Great Depression on children and adults.
- Cultural values can influence how we talk about and treat adults of different ages, and the paradigm of social constructionism is focused on exploring this level of analysis.

Recommended reading

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