

CONCEPTIONS OF DEVELOPMENT

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How do we think about psychological development? Initially, the idea may conjure up an image of a curve progressively climbing upwards throughout childhood, levelling off thereafter and then remaining steady until it starts to decline in old age – somewhat along the lines of physical growth. In fact, even physical growth is a rather more complex phenomenon than such an image suggests, and when it comes to psychological development the complications increase greatly, giving rise to all sorts of questions that need to be settled if we are to understand it. For instance, is it right to think of psychological functions as developing in a steadily upward manner, or is it more a matter of spurts and plateaus? Does the pattern of change, as well as its rate, vary from one individual to another and from one function to another? Does development indeed stop once the individual has reached adulthood? And, for that matter, is it justified to see psychological development in terms of quantitative change or are there qualitative changes too?

The core of development is change over age – a change that is not haphazard, not temporary and not easily reversible. To document change it is necessary to accumulate empirical information about such matters as age norms, sequences, trajectories and transitions, and then to discern the patterns which underlie such factual information. For this purpose a variety of concepts have been employed, of which the following are singled out and described below:

LIFE-SPAN DEVELOPMENT
DEVELOPMENTAL CONTINUITY
DEVELOPMENTAL TRAJECTORIES

Transition points

Equifinality **and** Multifinality

DEVELOPMENTAL STAGES

DOMAIN SPECIFICITY

Modularity

CONTEXT

Ecological systems perspective

Developmental niche

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

LIFE-SPAN DEVELOPMENT

MEANING Psychological development is not just something that happens to children, but is a process common to all ages. Additionally, it refers to all types of change – not just to acquisition but also to decline. This is the basic message conveyed by the concept of life-span development, which we can formally define as –

the process of change associated with age which characterizes all human beings from conception to death.

A life-span perspective does not refer to a single, coherent theory but to a particular orientation to the study of psychological development. It draws attention to the importance of not drawing an arbitrary line at some particular age point, such as the transition from adolescence to adulthood. The study of development can be applied to all ages, and it follows that no particular age period is more worthy of our attention than any other: all play some part in individuals' lives.

ORIGINS

Awareness of development as a life-long process emerged in systematic form only in the second half of the twentieth century. Before then attention was exclusively paid to childhood and adolescence; the idea that *development* can occur in *mature* individuals seemed a contradiction in terms. A few exceptions did occur; for example, G. Stanley Hall, one of the founding fathers of developmental psychology, became interested in the possibility of adult change as he himself aged, and in 1922 published a book with the provocative title *Senescence: the last half of life*. However, it was not till the 1960s that interest in adult development and ageing became systematized and that these topics gradually grew into major areas of research (e.g. Birren & Schaie, 1977); and it was later still that attempts first began to combine findings obtained from separately investigated age periods and integrate them into one coherent body of knowledge about development.

There are several reasons for the growing popularity of a life-span orientation in the past few decades. One is demographic: the population is ageing, and the very fact that there are more elderly people about creates a demand for knowledge about the psychological characteristics found at the end of an increasingly drawn-out life cycle. Initially the field of gerontology developed separately from the study of childhood; however, in so far as both are concerned with the nature of change over age it seemed sense to ask whether lessons learned in one field could be applied to the other and whether it would not be of benefit to develop concepts applicable to all ages. In the second place, there was the opportunity afforded by a number of longitudinal studies launched from the Institute of Human Development at the University of California several decades ago to examine the question of

CONCEPTIONS OF DEVELOPMENT

psychological continuity from early childhood into adulthood. The original aim of these studies was confined to providing information about the childhood years; however, the availability of the participants in adulthood tempted a number of investigators (e.g. Block, 1971; Elder, 1974) to follow them up and trace their developmental pathways over a much wider span than had previously been attempted. And finally, a variety of methodological advances (summarized by Schaie, 2002) in conducting longitudinal studies and interpreting their findings have brought increasing sophistication to research on life-span trends, making it possible, for example, to separate out individual patterns of change from the average growth curves that had previously been the sole source of information about developmental phenomena. It is mainly as a consequence of these three sets of influences that life-span issues are now widely recognized as legitimate concerns and as constituting important areas of enquiry.

In general terms the basic message of the life-span perspective is widely accepted: change occurs at all ages and we should therefore replace child-based accounts of development with models applicable to the total age range. In particular, there is agreement that change is not synonymous with growth (the curve going upward); as has now been amply demonstrated, development is far more varied than suggested by some single index of increase in size or knowledge or competence. Paul Baltes (1987; Smsith & Baltes, 1999), who has been one of the major contributors to this field, has proposed the terms *multidimensionality* and *multidirectionality* to characterize the nature of development: the former to indicate that different aspects of behaviour (such as various components of memory) may simultaneously show distinct courses of developmental change (see **domain specificity**); the latter to stress that decline of some functions may go hand in hand with stability or even improvement of other functions (something particularly evident among the aged). Thus development takes many different forms: already in childhood certain aspects of behaviour decline or drop out altogether, such as seen in the palmar reflex which is present only in the early weeks of life, or in the loss of the ability during infancy to detect certain sound contrasts in languages other than those in the child's native language. Other functions, on the other hand, such as the capacity of the sensory register in the memory store, remain virtually constant throughout life.

Given the comparatively recent origins of the life-span perspective it is perhaps not surprising that more precise theoretical formulations of what happens during the total developmental course are as yet sparse. While the need for concepts of development that have relevance beyond childhood and so perform an integrative function is generally acknowledged, only a few are at present available (though see below for the concepts of **developmental trajectories** and **transition points**). However, some useful proposals as to how we may think about the life course as a whole have been put forward; thus Shiner & Caspi (2003) have suggested a three-fold classification of the kind of descriptive approach that can be taken:

CURRENT STATUS

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

- 1 an *organizational-adaptive* approach, which sees the life course primarily in terms of the various challenges that people encounter at different ages and asks how these are met by individuals with different personalities;
- 2 a *socio-cultural* approach, which gives prominence to the sequence of culturally defined, age-graded roles that each person encounters over time;
- 3 an *evolutionary-psychology* perspective, which describes the life course in terms of the series of adaptations human beings have had repeatedly to contend with in the history of the species (see **Evolution**).

Such a taxonomy is useful in drawing attention to the complexity of the concept of life-span; equally useful is a classification proposed by Baltes, Lindenberger & Standinger (1998) of the factors that steer the course of life-long development, namely *age-graded* influences, i.e. those that are commonly encountered within a particular age range (e.g. school entry, puberty); *history-graded* influences, which are specific to certain time periods (e.g. the start of World War II, the advent of television); and *non-normative* influences, which affect only some individuals and may occur at any age (e.g. an accident, emigration). Age-graded influences have received most attention from developmental psychologists; however, one of the contributions of a life-span perspective is to draw attention to the role that historical events play in people's lives (see **context**), and the inclusion of non-normative influences reminds us that the developmental course is far from standardized and that some incidents unique to a specific individual may have considerable implications for that person's subsequent development.

Research inspired by the life-span perspective has steadily increased in amount and gone through a number of phases. In the first place, it stimulated a considerable number of studies specifically concerned with development at post-childhood ages, in particular among the aged (Schaie, 2002), which set out to trace change at that age but without any attempt to link up with change in earlier periods. Secondly, we have a large number of studies that did investigate such links by examining the continuity of psychological characteristics across age, including some ambitious efforts to follow up individuals from the very early years to maturity in order to determine whether adult characteristics can already be predicted in infancy (see **developmental continuity**). And finally and more recently, efforts have begun to be made to pinpoint the *processes* responsible for stability and change, i.e. to go beyond merely establishing continuities and ask *how* these come about (see, for example, Caspi, Elder & Bem's 1987 investigation of individuals who both as children and as adults were characterized by an 'explosive style', that is showed excessive temper tantrums and irritability).

FURTHER READING

Baltes, P.B., Lindenberger, U., & Standinger, U. (1998). Life-span theory in developmental psychology. In W. Damon, (Ed.), *Handbook of child psychology (5th ed.)*, vol. 1 (R.M. Lerner, Ed.). New York: Wiley. A detailed and fairly technical account of the ideas behind the life-span perspective and the empirical work it has generated.

CONCEPTIONS OF DEVELOPMENT

Smith, J., & Baltes, P.B. (1999). *Life-span perspectives on development.* In **M.H. Bornstein & M.E. Lamb (Eds.),** *Developmental psychology: an advanced textbook, (4th ed.).* Mahwah, NJ: Erlbaum. Somewhat less detailed than the above, but also more geared to readers new to the topic, with an account of the questions asked and methods used by life-span psychologists.

See also developmental continuity; developmental trajectories

DEVELOPMENTAL CONTINUITY

One of the major issues in developmental psychology is the extent to which individual characteristics remain constant across age, as opposed to becoming transformed in the course of development. No one can doubt that both trends occur: there must be continuity in some sense, for intuitively at least we feel basically as though we are the same individuals from childhood to old age; at the same time the very notion of development implies that there is change.

MEANING

Continuity may be defined as –

the preservation of individually characteristics over age.

Let us note, however, that this does not necessarily mean phenomenological sameness: an individual may remain highly aggressive from early childhood to adulthood, yet express aggression in very different ways at older than at younger ages. Continuity is thus not a matter of identical behaviour but rather of the kinds of connections that exist among age points: are these such that we can predict later characteristics from early ones? Prediction is at the core of continuity; if psychological attributes in some sense remain the same over time, expressing identical processes even though in different overt form, it should be possible to foretell the nature of future development, with considerable implications for intervention and help.

The issue of continuity and change has been of long-standing interest, but in the past was debated more on the basis of dogma than empirical evidence. On the whole a strong belief existed in continuity, based on one of two assumptions. The first was that we are born with certain characteristics fixed once and for all by our genetic endowment: whatever experiences we encounter will not affect what has been handed down to us by our inheritance. This argument was mostly applied to intelligence, which was viewed as an attribute constant over time so that, in theory

ORIGINS

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

at least, one should be able to use IQs obtained in infancy to predict intellectual performance in adulthood. Evidence to the contrary was for a long time simply disregarded, and it was only in the middle of the last century, on the basis of a large body of findings, that it was accepted that fluctuations in measured intelligence do occur and that prediction over age is therefore not the simple matter it was formerly thought to be (Hunt, 1961).

The other assumption underlying the belief in continuity was that experience in the earliest years leaves irreversible effects on our personality, and that our individuality is thus shaped for good by whatever events we encounter at that impressionable time. This is an argument put forward by writers as diverse as John B. Watson, the father of behaviourism, and Sigmund Freud, who for different reasons were both convinced that we are victims of our past, in that experiences absorbed in the first few years are of a foundational nature and thus likely to determine the course of personality growth once and for all. Again it follows that one should be able to predict outcome in maturity from infancy on: the impact of trauma and deprivation, for example, was said at that time to have life-long consequences that cannot be changed. However, this view too has had to be changed in the light of subsequent evidence: the effects of early experiences have not been found to be permanent under all conditions, however early and however severe they may be. As follow-up studies have repeatedly shown, some degree of change can be brought about in the psychological functioning of even quite badly affected children by appropriate measures: for example, some (though not all) children severely deprived as a result of spending their early years in grossly depriving orphanages can make up marked degrees of both physical and psychological deprivation if placed in caring, adoptive homes (Rutter and the ERA Study Team, 1998; Rutter, Kreppner & O'connor, 2001). As is now widely acknowledged, continuity in this respect too is therefore not as absolute as had once been thought (Schaffer, 2002).

CURRENT STATUS

Ascertaining the nature and extent of psychological continuity has become a most lively topic of research. This has been brought about, in part at least, by methodological advances in carrying out longitudinal studies, both of a prospective and a retrospective nature. However, what is now clear is that the concept of continuity is a highly complex one, involving several different meanings distinguished largely by different ways of measuring continuity (see Caspi, 1998, for an extended discussion). Two in particular need to be distinguished:

1 *Relative continuity*, which is based on the extent to which individuals retain their rank order in a particular sample from one assessment point to another, as measured by the correlation coefficient for the scores obtained at the two ages. Continuity in this sense thus refers to individuals' standing relative to other members of the sample; it does not, however, say anything about the actual level of individuals' scores and whether that changes between ages.

CONCEPTIONS OF DEVELOPMENT

2 *Absolute continuity*, which refers to the extent to which some particular attribute remains stable in individuals over time. It is thus concerned with the constancy of test results in the course of development, and is assessed by comparing the actual scores of individuals as found at different ages.

The majority of investigations to which the concept of continuity has given rise have taken the first of these two forms. They have concerned themselves with a range of psychological attributes and asked a variety of questions. For instance: Can the origins of mature personality be traced back to temperamental qualities evident in infancy (e.g. Caspi, 2000)? Do the most salient aspects of personality, such as the so-called Big Five (e.g. Agreeableness, see Laursen, Pulkkinen & Adams, 2002) have specific antecedents in the behaviour patterns of young children? What about aggression: do aggressive children become aggressive adults or, for that matter, were aggressive adults also aggressive children (e.g. Huesmann Eron & Lefkowitz, 1984)? Similarly with shyness: is this an enduring quality, so that one can predict from the behaviour of babies confronted by a stranger their behaviour in social situations in later years (e.g. Kagan, Snidman & Arcus, 1998)? Or, to take an example of great practical importance, does maladjustment in the early years necessarily signify maladjustment at subsequent ages (e.g. Caspi & Moffitt, 1995)? And finally, taking the psychological quality where this debate originally started, is intelligence predictable from one age to another (e.g. Slater, Carrick, Bell & Roberts, 1999)?

Three basic questions underlie the research efforts that have been undertaken in this area. The first is concerned with establishing the sheer amount of continuity – the extent to which prediction is feasible for particular attributes and particular age spans. Secondly, there is the problem of the conditions under which continuity or discontinuity can be found – conditions such as individual differences in children's dispositions, their family circumstances and their life experiences generally. And third, what are the mechanisms responsible for bringing about continuity: is it, for example, a matter of genetic processes that function similarly at different ages, or is it determined by environmental influences which promote continuity of personality functioning because they themselves remain stable? Although research on the topic of continuity is still a relatively new field of endeavour, a number of conclusions can be stated with confidence. To summarize:

1 Continuity of psychological characteristics, as expressed by correlation coefficients between ages, is rarely more than moderate. Discontinuities do occur, making prediction hazardous. It is only at the extremes of the distribution (the very shy, say, or the highly aggressive) that it is possible to predict with any certainty.

2 The degree of continuity depends in part on a combination of age and interval: the older the individual the more likely it is that attributes remain stable, and the shorter the interval between assessments the greater will be the extent of continuity.

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

3 Continuity also varies from one behavioural domain to another. It is, for example, especially marked for emotional maladjustment (Rutter & Rutter, 1993): if present at age 3 there is a three-fold increase in the risk of its presence at age 8.

4 It is essential to take into account the degree of continuity of the child's environment: drastic changes in life experience may well disrupt established patterns of behaviour, as seen, for example, in fluctuations of attachment security under conditions of family disturbance (Goldberg, 2000).

5 Continuity is basically not a matter of carrying forward identical response patterns, nor can it necessarily be assessed by performance on similar tests. For example, IQs obtained from tests administered to infants bear virtually no relationship to IQs obtained from the same children at older ages; on the other hand measures of infants' information processing capacity, as obtained from habituation tasks, are much more likely to predict later intelligence (Slater et al., 1999). The same underlying predisposition may manifest itself in different ways at different ages: similarity at a conceptual rather than a behavioural level provides the link.

FURTHER READING

Caspi, A. (1998). *Personality development across the life course.* In W. Damon (Ed.), *Handbook of child psychology (5th ed.)*, vol. 3 (N. Eisenberg, Ed.). New York: Wiley. A general overview of research on personality development that contains a section on continuity across the life-span.

Rutter, M. (1987). *Continuities and discontinuities from infancy.* In J.D. Osofsky (Ed.), *Handbook of infant development (2nd ed.)*. New York: Wiley. Especially valuable for clearly outlining the methodological and conceptual complexities involved in finding answers to the problem of continuity.

See also developmental stages; developmental trajectories; life-span development

DEVELOPMENTAL TRAJECTORIES

and: TRANSITION POINTS

EQUIFINALITY AND MULTIFINALITY

MEANING Also sometimes referred to as *developmental pathways* or *life course patterns*, trajectories are –

CONCEPTIONS OF DEVELOPMENT

the paths that individuals follow in the course of development, including the long-term patterns of behaviour adopted, the challenges encountered and the manner of meeting them, and the implications that particular courses have for long-term adjustment.

Thus, given a particular starting point such as a high level of antisocial behaviour at age 7, by what specific steps do some children turn into law-abiding adults while others retain their previous ways of behaviour? Are there certain crucial events that account for change and certain ages when this is more likely to occur? Trajectories take very many different forms, for they are affected both by individuals' make-up and by life experiences, and they serve thus to draw attention to the great range of individual differences to be found in the developmental course, even when individuals have similar starts or encounter identical events during their formative years. Instead of regarding these early experiences as determining once and for all outcome in maturity, the concept of trajectory draws attention to the fact that development should be thought of as (to quote Clarke & Clarke, 2000) 'a series of linkages in which characteristics in each period have a probability of linking with those in another period. But probabilities are not certainties, and deflections of the life path, for good or ill, are possible ...'. The impact of any particular experience, that is, needs to be seen in the context of each individual's total life path, and attention must therefore be paid to the modifying role of other events, both before and after.

To a considerable extent trajectories are determined by the way in which an individual negotiates the **TRANSITION POINTS** that everyone encounters from time to time in the course of development. A transition point is basically concerned with the possibility of change of trajectory; it is a form of change which may occur more or less abruptly at some particular point of development, and can thus be defined as –

the choice confronting an individual in the course of development as to which of several alternative pathways to follow, resulting in some instances in a radical alteration of life circumstances.

To stay on at school or to leave; to obtain an unskilled job or to undertake further study or training; to marry one individual or another – these are some of the alternatives with which people may be confronted, with considerable implications for further development. The choices are by no means always free but can be forced upon individuals by situational pressures; nevertheless, whatever pathway is taken may well reinforce or, on the contrary, minimize the consequences of previous experiences and determine the future direction of the trajectory.

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

ORIGINS

The concept of trajectories is closely related to the work on continuity and change described earlier. As that work has demonstrated, it is rarely possible to find direct, one-to-one links between early characteristics or events and future outcome; research that jumps straight from early to later ages is therefore of limited use and needs to be extended by studies of the intervening period in order to spell out how individuals can develop so differently after the same early start. The notion of developmental trajectories was therefore adopted as a way of thinking about continuity and change by drawing attention to the need to investigate all the relevant links involved in the life path.

As a consequence, recent work has come to pay far more attention to individual differences in children's psychological development rather than emphasize uniformities. Recognition has been given, that is, to the diversity of trajectories to be found in different individuals – illustrated, for example, by the fact that early trauma does not inevitably result in later pathology and that survivors as well as victims emerge from such experiences. It follows that attempts to explain the processes involved usually require a highly ambitious undertaking, in which individuals are followed up longitudinally and repeated assessments are made of both their psychological characteristics and their life circumstances. An excellent example of such an undertaking is the Christchurch Health and Development Study – a prospective longitudinal investigation carried out in New Zealand, based on a representative sample of more than 1,200 children who were followed up from birth to early adulthood and assessed repeatedly during this interval. Research such as this can give rise to a wealth of findings about the nature of developmental trajectories, the sequence of steps that make up different kinds of trajectories and the mechanisms underlying continuities in behavioural development (for examples of some specific reports, see Fergusson & Horwood, 1998; Fergusson, Horwood & Lynskey, 1992; Fergusson & Lynskey, 1997). Such studies are costly and time-consuming and therefore still few in number, but they have already shown a considerable potential for adding to our knowledge about developmental processes.

CURRENT STATUS

A variety of purposes underlie research on developmental trajectories. In the first place, studies have aimed to provide detailed description of the course of particular traits. Instead of assessments carried out on just two occasions, once early on and then again many years later, they have filled the gap with repeated assessments, especially at ages thought to be crucial in the development of that particular characteristic. To quote an example from a report by the NICHD Early Childhood Research Network (2004): when the course of aggression in a sample of over 1,000 children was traced over the age period 2–8 years by means of repeated assessments, five different trajectories were identified on the basis of level of aggression and the kind of changes that occurred in this level. In this way it was possible not just to provide a detailed account of the development of physical aggression in general but also to do justice to individual variation.

CONCEPTIONS OF DEVELOPMENT

In the second place, an important lesson has been learned by investigating trajectories – a lesson summarized by the concepts of **EQUIFINALITY** and **MULTIFINALITY**. Equifinality refers to the fact that –

there is more than one developmental pathway to a given outcome.

Take antisocial behaviour: individuals manifesting severe levels of conduct disorder or delinquency have been found to be quite heterogeneous in the developmental course leading up to such behaviour (e.g. Frick, Cornell, Bodir, Dane, Barry & Loney, 2003). Thus relevant aetiological factors such as genetic predisposition, parental rearing patterns, educational opportunities and peer group pressures may operate in different combinations to produce identical results.

Multifinality indicates that –

identical early experiences do not necessarily result in the same outcome.

As, for example, the literature on early deprivation has repeatedly shown (Schaffer, 2002), it is impossible to predict individuals' adjustment and competence as adults on the basis of the deprivation experience alone – heterogeneity is the rule. Thus both equifinality and multifinality present a very different view to that which ties antecedents to outcome in a one-to-one correspondence.

Thirdly, attention to the intervening period makes it possible to pinpoint the factors that are associated with change of course. For example, Ge, Lorenz, Conger, Elder & Simmons (1994) explored the manifestation of depression at annual intervals from age 9 to 20, and noted a sharp increase among girls, though not among boys, around 13 years. When examining the factors that covary with this change they found that the increase was linked to a rise in life stresses of one kind or another, but especially so among girls who received little warmth and support from their mothers. It appeared therefore that particular combinations of gender, stress and family relationships can account for the various patterns of change observed in the trajectory of depression in children at this age.

Finally, there are studies that focus specifically on the transition points that are such a prominent feature of all developmental trajectories. For example, Rutter, Quinton & Hill (1990) set out to investigate the link between deprivation in childhood and becoming a depriving parent in adulthood. A group of mothers who had spent a major part of their early years in institutions were indeed found to be markedly impaired in their sensitivity and warmth with their children; however, not all members of the group were so affected in that some of the mothers functioned perfectly well in their parental role (an example of multifinality). The reason for the

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

different outcome was found to lie in the kinds of intervening experiences encountered by the mothers; above all, getting married to a supportive and well-adjusted partner enabled the women to function generally well and in particular to establish sound relationships with their children; choice of an unsatisfactory partner, on the other hand, was more likely to reinforce a woman's previous patterns of malfunctioning and result in inadequate parenting. The fact that this did not occur till adulthood did not detract from the influence exerted in counteracting trajectories followed during the childhood years.

FURTHER READING

Elder, G.H. (1985). *Life course dynamics: trajectories and transitions*. Ithaca, NY.: **Cornell University Press**. Written by one of the main contributors to this topic, the book illustrates the kinds of findings obtained from follow-up research.

Elder, G.H. (1998). *The life course as developmental theory*. *Child Development*, **69**, 1–12. A brief but useful outline.

Rutter, M. (1996). *Transitions and turning points in developmental psychopathology*. *International Journal of Behavioral Development*, **19**, 603–626. A detailed analysis of the concept of transition points, showing by reference to research findings the role these play in development.

See also developmental continuity

DEVELOPMENTAL STAGES

MEANING How should we characterize the course of development – as a constantly rising curve or as a step-like structure? In terms of steady quantitative accretion or as a series of leaps? Both models have had their adherents, with the debate for a long time based on the assumption that it had to be one or the other – accretion or stages.

A stage can be defined as –

a distinct phase of life characterized by a unique set of mental characteristics.

Three principal criteria have been proposed to identify a stage (Flavell, Miller & Miller, 1993):

CONCEPTIONS OF DEVELOPMENT

1 *Reorganization*: developmental change is heralded by the appearance of a qualitatively different form of functioning; in other words it is not so much a matter of getting better but rather of acting in a distinctive new manner.

2 *Abruptness*: the transition from one stage to another takes place relatively speedily and suddenly.

3 *Concurrence*: change occurs simultaneously and in a similar manner across a wide range of mental functions.

Stage theories appear in many different versions. In some of these the concept of stage is not 'real' but merely a descriptive device: for convenience sake, that is, a continuous progression is more or less arbitrarily cut up into segments, thereby making it easier to describe the change taking place. The most influential stage accounts, however, do conceive of stages as distinctive shifts, brought about in a predetermined manner common to all members of the human species and appearing in an invariant order, so that skipping any one of them is impossible.

For much of the twentieth century the two contrasting views, stage models and accretion models, existed side by side, though espoused by adherents of opposing theoretical orientations, depending mostly on whether they saw the source of developmental change as located primarily in the organism or in the environment – as stemming from maturation or from the effects of experience. Advocates of maturation found stage language congenial as a way of describing the periodic reorganizations that they believed to be built into the organism as part of its biological inheritance; the experiential view, on the other hand, appealed to adherents of the various learning theories who saw change as resulting from the gradual shaping of the individual in the course of encounters with the environment. Little attempt was initially made to settle the issue by examining directly the course of developmental change; the debate was conducted instead on a global theoretical plane.

Stage theories were espoused by many of the most influential writers on developmental psychology in the last century, though there were considerable differences between them in the psychological domains described, the number and nature of the stages proposed and the age ranges assigned to them. Consider the distinctive approaches adopted by Freud, Erikson, Gesell and Piaget. Freud's (1949) aim was to trace human beings' psychosexual development, which he described as passing through a series of five stages (oral, anal, phallic, latency and genital), each based on different libidinal needs occurring in sequence from infancy to maturity. Erik Erikson (1950), though also a psychoanalyst, put forward a very different developmental scheme, concerned with psychosocial adjustment in general and the formation of personal identity in particular, and encompassing eight stages, each confronting the individual with a particular developmental task. Easily the most enthusiastic proponent of a stage approach, however, was Gesell (1954): his concern was to document in very

ORIGINS

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

great detail the emergence and manifestation of the numerous perceptual, motor, verbal and personal-social abilities that appear in the early years – a task for which he found stage a useful, indeed essential device. As Thelen and Adolph (1994) put it, he thereby ‘raised stage theory to an unparalleled degree of refinement. Who before or since has had the tenacity to describe 58 stages of pellet behaviour, 53 stages of rattle behaviour, and so on for 40 different behavioural series?’ Gesell was convinced, however, that stages serve not only a descriptive but also an explanatory function, in that they represent the outward manifestation of human beings’ biological equipment and thus account for the orderly change so characteristic of early behavioural development (further described under **maturation**).

It was Piagetian theory, however, that stimulated most discussion about the uses and misuses of stages. Piaget saw his four major stages (sensori-motor, preoperational, concrete operational and formal operational) as representing sequential levels of adaptation, in each of which children’s thinking is characterized by a particular kind of mental organization, giving rise to a fundamentally distinctive view of the world. The stages appear in an invariant order, each replacing its predecessor, and while Piaget, unlike Gesell, did not see their emergence as an automatic unfolding but as dependent on nurture as well as nature, he was convinced that the same sequence characterizes all members of the human species. Piaget (again unlike Gesell) was not interested in providing norms of development; his concern rather was to characterize the dominant mental approach to problem solving that can be found at various ages, and for this purpose a structure of successive stages appeared to him to be well suited.

CURRENT STATUS

Since about the 1970s, stage models, have been on the wane. Increasingly it has become necessary to acknowledge that the picture of human development they provide is inaccurate. To a large extent the disillusionment stemmed from efforts to replicate Piaget’s account of the way children’s thinking progresses over age, for unlike much of the rest of Piaget’s theorizing his stage notions have come to attract a considerable body of criticism. That criticism centred in the first place on the age of transition between stages given by Piaget, albeit usually in approximate terms. As Donaldson (1978) and others have pointed out, the age when a child is judged to become capable of a new cognitive achievement depends not merely on the readiness of the appropriate mental structure (as Piaget believed) but also on the demands imposed by the assessment task, that is, on the complexity of the procedures and the nature of the instructions employed. By devising tests that were simpler in nature than traditional Piagetian ones and did not rely unduly on verbal instructions and answers, much younger children were found to be capable of performing at a higher level. Piaget, it appeared, had grossly underestimated young children’s cognitive abilities.

If it were merely a matter of shifting age of attainment downwards the stage concept would remain intact. However, doubts have also been raised about the extent to which children’s cognitive development proceeds as the three criteria for stages listed above would lead one to expect:

CONCEPTIONS OF DEVELOPMENT

1 Reorganisation. There is no doubt that periodic changes involving the qualitative nature of mental organization do occur, each resulting in a very different style of thinking and problem solving – see, for example, the attainment of object permanence taking place towards the end of the first year, or the transition from sensori-motor functioning to representational action in the middle of the second year. Yet there is also wide agreement that to characterize development solely in these terms is inaccurate: continuous quantitative changes occur too, as seen in aspects of children's information processing capacity such as speed and span. The sharp dichotomy between stage models and accretion models has been abandoned; instead of arguing for one *or* the other the search is on for ways of describing the interplay between the two kinds of change.

2 Abruptness. This criterion too is not as straightforward as once thought. Much depends on how a new achievement is assessed. Object permanence, for example, appears to develop relatively suddenly if the measure is the child's ability to retrieve an object that has just been hidden under a single cover; yet, as Piaget himself pointed out, much goes on in the preceding months to bring about this step and in the following months to elaborate upon it. Similarly with conservation and indeed with most other cognitive developments: detailed examination indicates that these rarely if ever appear suddenly and that gradual and slow change is the rule.

3 Concurrence. This stage criterion has become the major arena for debate in recent years. Are developmental changes as pervasive, across-the-board as the Piagetian account appears to suggest, or does change occur independently, in terms of timing and/or nature, in different areas of cognition? In fact Piaget is often misrepresented in this respect: as his account of conservation shows, he did make allowance for different content areas developing according to different timetables, and specifically used the concept of *horizontal decalage* to stress that children learn to conserve an aspect like substance years earlier than they are able to conserve volume. And yet, with respect to many other cognitive characteristics he made no allowance for variation according to content area, thus asserting his belief in a degree of coherence of mental functions that further evidence has not been able to confirm. **Egocentrism** is a particularly notable example: instead of giving way at the same age with respect to all aspects of mental functioning (as Piaget believed) it is now apparent that there are marked differences between the perceptual, affective and cognitive domains – that is, when children realize that others may see or hear things differently, feel about things differently and have different knowledge about things. Thus far greater diversity in developmental pattern is to be found among specific cognitive functions than stage theories allow (see **domain specificity** for further discussion).

It is now widely accepted that cognitive development does not proceed as uniformly stage-like as had once been thought, and that in some respects at least accounts dressed in stage terms confuse and mislead by oversimplifying the nature

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

of development. What has not been settled, however, is whether the concept of stage should be abandoned altogether (as some advocate), or whether (as others argue) stage-like changes are specific to particular aspects of cognitive functioning, though intertwined with overall quantitative advances.

FURTHER READING

Fischer, K.W., & Silvern, L. (1985). Stages and individual differences in cognitive development. *Annual Review of Psychology*, 36, 613–648. Sets out to disentangle the arguments for and against stages by drawing on research on cognitive development.

Miller, P.H. (2002). Theories of developmental psychology (4th ed.). New York: Worth Publishers. This useful book contains some detailed discussions of the concept of stage as applied in the theories of Freud, Piaget and Erikson.

See also domain specificity; Maturation

DOMAIN SPECIFICITY and: MODULARITY

MEANING Domain specific views of development stand in sharp contrast to domain general views. Both have been employed primarily in relation to cognitive development, but whereas domain general views assume that all aspects of cognition are controlled by the same set of mental mechanisms, domain specificity refers to –

the belief that each mental domain is served by its own specific mechanisms and that development in any one domain therefore takes place independently of development in any other.

Underlying this discussion is the question of how the mind is constructed. According to some (and Piaget is the best known example), human beings are endowed with a general set of mental mechanisms, limited in number, that operate in a uniform manner across all areas of psychological functioning and that account for all types of developmental change. Others, however, on the basis of increasing evidence that such uniformity is illusory, have concluded that the mind appears to be far more compartmentalized than the domain general view allows, and that it is therefore necessary to postulate the existence of different mental mechanisms for different cognitive domains.

CONCEPTIONS OF DEVELOPMENT

ORIGINS

As more research on a range of specific cognitive abilities came to be carried out in post-Piagetian years, it became evident that far more discrepancies in developmental patterns occur than domain general theories allow for. Take the following lines of evidence:

1 The clearest examples are to be found in cases of pathology. Autistic children develop normally with respect to a wide range of cognitive functions, yet are severely impaired in all tasks involving the understanding of mental states. On the other hand, children with Williams Syndrome (another congenital disorder) show marked deficits in areas such as planning, and spatial and numerical reasoning but function well with respect to language and social cognition. An even sharper contrast is presented by idiots-savants, who are severely retarded right across the board except for one specific skill such as drawing, where they may be quite outstanding (Karmiloff-Smith, 1992).

2 Disparities in performance, though of lesser scale, are apparent in most children's cognitive functions. For example, the mental skills employed to understand the three domains of physical, biological and psychological phenomena have been found to develop independently and at different rates, the intra- individual variations occurring in all children (see **theory theory** for more details).

3 Competence may also vary according to individual children's acquired knowledge. To quote a classical example (Chi, 1978): expert chess players aged 10 years were able to remember the layout of a chess board far better than adults with no such expertise, yet the children's memory for digit strings showed no such advance. Memory, that is, does not develop in domain general fashion; it is tied to specific experience rather than to general intelligence.

4 According to Gardner (1984), there is now sufficient evidence to abandon the idea of general intelligence altogether and substitute a package of multiple intelligences, such as linguistic, musical, logico-mathematical, spatial, bodily kinaesthetic and personal intelligence. Each is conceived as a discrete information processing operation, with its own separate brain-based location.

Historically of most importance, however, are Chomsky's ideas about the nature of the human language system, for these represent the first coherent account of domain specificity (see **universal grammar**). In contrast to Piaget's assertion that language is an integral part of general intelligence and develops in common with other aspects of symbolic representation such as pretend play, and in contrast also to Skinner's belief that general learning principles can explain children's linguistic development, Chomsky (1988) saw language as an independent mental organ distinct in structure and function from other aspects of the mind, operating according to a set of biologically specified rules that differ from those on which other systems such as vision and numeracy are based. The mind, that is, must be seen as consisting of a series of separate domains, the working of each of which

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

requires investigation in its own right. The details of Chomsky's views on language development have encountered considerable criticism; his influence on subsequent accounts of the domain specific nature of the mind, however, cannot be disputed.

One of the most important attempts to formalize a domain specific view of cognitive functions was made by the philosopher Jerry Fodor (1983), who proposed the concept of **MODULARITY** to indicate that -

different aspects of cognition are represented in the brain by inbuilt structures, each of which functions on its own as a processor of some specific types of input from the environment.

These modules, as he referred to them, are part of each individual's neural network, innate in origin and adapted in the course of evolution to perform only certain quite specific cognitive tasks: the processing of spoken language, the recognition of faces and of voices, the perception of colour, the analysis of shape, and so forth. Each module is pretuned to process only one particular distinctive kind of information from the environment, responding to such data in an automatic, speedy, highly constrained manner and functioning quite independently of any other part of the mental apparatus. As Karmiloff-Smith (1992) put it, this layer refers to 'the parts of the human mind that are inflexible and unintelligent', representing 'the stupidity of the machine'. However, the output of the modules is then passed on to another layer, functioning as a central information processor, which uses the information to perform higher conceptual functions such as coordinating, rearranging and planning. The human mind, according to Fodor, should thus be seen as an organ basically composed of a set of fixed, domain specific structures, though presided over by a much more flexible domain general mechanism.

CURRENT STATUS

Considering the frequency with which the concept of domain is mentioned in the research literature, it is ironic that there is still so much confusion as to what domains are – their nature, their developmental origin, their content and how to identify them. The term has been used in several quite different senses (Wellman & Gelman, 1992), in particular:

- 1** as innately specified neural devices, i.e. as identical to modules;
- 2** as limited areas of knowledge, thus distinguishing them according to their content;
- 3** as distinctive sets of mental processes, using the particular operations performed for purposes of definition;
- 4** as specific cognitive tasks, such as classification or seriation.

Just to identify domains and specify their boundaries is thus a matter of controversy (Keil, 2002): for example, a domain may designate some highly localized area of

CONCEPTIONS OF DEVELOPMENT

expertise such as knowledge of chess; on the other hand, it may also be used to refer to certain widely encompassing realms such as those of physical, biological and psychological knowledge (mentioned above) about which children are said to develop early but quite distinctive theories. This issue in turn has implications for the sheer number of domains said to exist: in the former case there are thousands that could qualify while in the latter there are very few. Even when, say, language is regarded as an area in its own right there is disagreement as to its make-up: should it be seen as a unitary domain or as a series of distinct, more narrowly defined domains involving aspects such as syntax, phonology and lexicon? Even such a strictly delimited function as pronoun acquisition has been designated as a domain. As yet, no agreement has been reached on how to choose candidates for the designation of domain.

However domains are conceptualized, few now believe that an unqualified domain general view of development can be justified. The evidence that cognition is made up of a considerable variety of abilities specialised for handling different kinds of information is too convincing for that. Yet it has also become apparent that it is not a matter of *either* domain generality *or* domain specificity – that only one type of operation is possible and that therefore a choice has to be made between the two. There are indications that domain general processes co-occur with domain specific ones: for instance, speed of information processing shows developmental advances in an across-the-board fashion underlying a whole range of domain specific abilities; similarly the capacity of working memory influences a large number of specific cognitive skills. Thus one type of mechanism need not preclude the existence of the other; it seems more likely that development depends on both. A more meaningful question to address therefore is how the two interact (see Case, 1992, for one attempt to bring about such a reconciliation).

The concept of modularity has also come in for some lively discussion, especially with respect to Fodor's belief that modules are innately fixed and remain unchanged throughout development. Thus Karmiloff-Smith (1992) has argued that the more pre-determined the cognitive system is in its functioning the less room there would be for the high degree of flexibility of thought and creativity that are the hallmarks of the human mind. The view she advocates is a more epigenetic one (see **epigenesis**), in that she agrees with Fodor that modules have an innate origin but that they are no more than predispositions which can be changed in the course of an individual's development. They are thus a product of both endowment and experience – a joint process which Karmiloff-Smith refers to as *modularization*. The debate is by no means settled, though recent evidence from neurocognitive studies supports on balance the epigenetic view as the more likely (Mareschal, Johnson & Grayson, 2004).

FURTHER READING

Hirschfeld, L.A., & Gelman, S.A. (1994). *Mapping the mind: domain specificity in cognition and culture.* Cambridge: Cambridge University Press. Contains a

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

wealth of different approaches to the topic of domain specificity, with a particularly useful introduction by the editors.

Karmiloff-Smith, A. (1992). *Beyond modularity: a developmental perspective on developmental science.* Cambridge, MA: MIT Press. Influential discussion of the way the human mind is organized and the extent to which a modular view can contribute to our understanding.

Mareschal, D., Johnson, M.H., & Grayson, A. (2004). *Brain and cognitive development.* In J. Oates & A. Grayson (Eds.), *Cognitive and language development in children.* Oxford: Blackwell. A brief but authoritative outline of the main issues concerning domain specificity and modularity.

See also cognitive architecture; developmental stages; epigenesis; theory theory

CONTEXT

**and: ECOLOGICAL SYSTEMS PERSPECTIVE
DEVELOPMENTAL NICHE**

MEANING

It is widely agreed nowadays that it is insufficient to look for explanations of development solely within individuals; rather, that it is essential also to take into account the wider context in which individuals function. Yet more often than not the meaning of the term *context* is taken for granted, on the assumption that it refers to the external situation in which individuals find themselves and is thus equivalent to *environment*, with no further effort made to define and analyse it. However, in the light of those studies where such efforts have been made the most useful definition of context to emerge is –

the multi-layered setting in which an individual's behaviour takes place, as perceived by that individual.

Let us comment on the various parts of that definition:

1 'Multi-layered' draws attention to the fact that at any one moment of time individuals function in a complex system of different types of contexts, among which physical, interpersonal, cultural and historical settings can usefully be distinguished. According to some writers these operate as a hierarchy, and various proposals have been put forward as to ways of conceptualizing such a hierarchy (e.g. Bronfenbrenner & Morris, 1998; Hinde, 1992).

CONCEPTIONS OF DEVELOPMENT

2 'Setting' is used rather than environment, as the latter tends to be thought of only as the individual's physical surroundings and thus neglects the other types of context. In addition it is important to stress that the setting in which development takes place is often far from static, as implied by the term 'environment'; much of early learning, for example, occurs in interpersonal contexts in which an adult may well be continuously adjusting the kind of guidance given in the light of the latter's changing understanding (see **scaffolding**).

3 The phrase 'as perceived by that individual' indicates the vital role which the child plays in evaluating and interpreting the setting. In other words, the traditional dichotomy between individual and context, between 'inner' and 'outer', is much too sharp: the 'outer' can become part of the 'inner', with the two aspects forming one total system. This is well reflected in Mercer's (1992) assertion that 'what counts as context for learners ... is *whatever they consider relevant*' (emphasis added).

It is true that some of the pioneers of child psychology, such as James Mark Baldwin and John Dewey, already argued for the importance of not considering children in a vacuum but relating their behaviour to contextual variables. Yet whatever general agreement this assertion elicited, it was rarely applied to the practice of research. More often than not investigations took place under laboratory conditions, the laboratory being regarded as 'neutral' and therefore not worth considering as a possible source of influence. Instead, explanations were individual-based and context-free, the assumption being that findings so obtained could be generalized across all settings.

This changed as part of the disenchantment with Piagetian theory. For one thing, Margaret Donaldson (1978) demonstrated empirically that context does matter, that children's performance even on traditional Piagetian tasks is affected by the extent to which the task is made meaningful and that all reasoning should therefore be seen as embedded in particular settings. And for another, Vygotsky's writings were belatedly discovered and translated (1962, 1978), with their emphasis on the interpersonal and cultural context of development and the importance of not seeing the child as a lone learner but as a participant in joint, culturally determined problem solving exchanges with others (see **zone of proximal development**). As a result, instead of explaining cognitive development wholly in terms of mechanisms operating within the individual it came to be recognized that processes such as attention, memory and learning are affected by what is 'outside' the child, giving rise to the idea of *situated cognition* and the adoption of a social-contextual perspective in the investigation of 'internal' processes (Gauvain, 2001). And at the same time it was realised that laboratory-based studies, if used exclusively, may in some respects be misleading and that investigations of children's behaviour in real-world settings play an essential part too.

ORIGINS

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

CURRENT STATUS A large body of evidence is now available to show that children's learning abilities and task performance are indeed a function of context. To give a few examples:

- 1** Preschool children show more advanced conversational skills at home with their mothers than at nursery school with their teachers (Tizard & Hughes, 2002).
- 2** Children aged 9–15 working in street markets in Brazil made complicated arithmetical calculations more effectively at their 'real-world' market stalls than they did in their classrooms (Carragher, Carragher & Schlieman, 1985).
- 3** Children and adolescents, asked to arrive at a judgement concerning some social issue, used different forms of reasoning according to the context (peer group, friendship and school) to which the issue applied (Killen, Lee-Kim, Mc Glothlin & Stangor, 2002).
- 4** Aboriginal children, living in the wilds of central Australia where navigational skills for finding the way in almost featureless desert landscapes are essential, performed much more competently on spatial memory tasks than on other types of memory tasks. White children living in urban environments, on the other hand, were inferior to Aboriginal children on spatial but superior to them on other tasks, their performance on the two kinds of problems being more or less at the same level (Kearins, 1986).

Merely to show that behaviour varies according to context is, of course, not enough. It is also necessary to unpack the concept of context in order then to account for the part it plays in influencing the course of development. By far the most sophisticated conceptual scheme that has been put forward in this respect is that by Urie Bronfenbrenner (1979, 1988), whose **ecological systems perspective** represents –

a framework for systematically arranging the influences from the multiple settings which children encounter, and for investigating the interaction between these influences and the individual over the life course.

According to Bronfenbrenner, settings can be viewed as a set of nested systems, each inside the next, rather like a set of Russian dolls. The following layers can usefully be distinguished:

- 1** *Microsystems*, that is, the part of the environment with which children are directly in contact. Home, school and peer group are examples; it is here that children have most opportunities to become involved in face-to-face contact with the people who can initiate behavioural change.

CONCEPTIONS OF DEVELOPMENT

2 *Mesosystems* are the links between microsystems, for example the home–school link or the family–peer group link. Such relationships need to be taken into account, because what happens in one microsystem may well affect what happens in another.

3 *Exosystems* are settings in which the child does not directly participate but which nevertheless affect development. An example is a parent’s work experience: what happens there may well spill over into the home and influence the child via the relationship with the parent.

4 *Macrosystems* refer to the overarching structures of the particular culture in which children live. They include the lifestyles, belief systems, customs and opportunity structures of each society, which determine what happens at the lower levels.

5 *Chronosystems* are a more recent addition to the scheme. They represent the time dimension of children’s experiences, thus acknowledging the fact that each individual’s life course is embedded in a particular historical context – a period of economic depression, a war or sudden technological advance – that helps to determine the developmental course of children living through that time.

Each system can be studied in its own right, yet they are closely interdependent and exercise a reciprocal influence on each other. Research has concerned itself mostly with the impact on children of immediate contexts, especially that of the family, but it is the virtue of Bronfenbrenner’s scheme that it reminds us of the role that more remote contexts also play (see the volume edited by Elder, Modell & Parke, 1993, entitled *Children in time and place*), and that it draws attention to contexts not previously investigated in relation to children’s development such as historical time (e.g. Moen, Elder & Luscher, 1995). It is also to Bronfenbrenner’s credit that he has increasingly emphasized the need to understand the *processes* whereby contexts produce developmental effects (Bronfenbrenner & Morris, 1998): instead of being merely content with what he calls the *social address model*, referring to global descriptive labels such as social class, parental education and maternal employment status, it is essential to explain *how* context can bring about change in individuals’ functioning.

There have been other proposals for conceptualizing context, notably the notion of **DEVELOPMENTAL NICHE**, advanced by Super and Harkness (1986, 1997) – two cross-cultural psychologists keenly aware of the diversity of contexts that children experience in different societies. Developmental niche refers to –

a child’s place within a particular community, as determined by the multiple cultural influences on child development prevalent in that community.

KEY CONCEPTS IN DEVELOPMENTAL PSYCHOLOGY

According to Super and Harkness, it is useful to distinguish three types of such influences: (1) the physical and social settings in which the child lives, (2) the customs of child care as regulated by each culture and (3) the psychological characteristics of caretakers. The three sets operate together to mediate each individual's experience within their specific community, and it is their regular occurrences that provide children with the opportunities to learn the rules of their culture (see **gene–environment correlation** regarding 'niche picking', that is, children actively selecting or creating their own environments).

The general thesis, that accounts of development must not just be child-based but also consider contextual influences, is now widely accepted. In addition, there is agreement that context should not be left as just an amorphous mass but requires analysis and conceptual ordering and, what is more, that we need to go beyond merely identifying and describing contexts but must proceed to understand the *processes* that account for the reciprocal influences at work in the interaction of contexts and children. However, other than processes operative in family interaction settings and in peer groups, there is still a great deal of ignorance about the way in which contextual effects exert their influence; moreover, justice is rarely done to the fact that children are often exposed to a variety of contexts acting simultaneously – for example, the child at school who is confronted at one and the same time by the physical environment of the classroom, the interaction with the teacher, the presence of peers and beyond that the cultural setting that governs the nature of what is taught and how it is taught. As Bronfenbrenner's scheme makes clear, context is a multidimensional concept, and the dynamic interplay of the different components thus requires to be analysed.

FURTHER READING

Bolger, N., Caspi, A., Downey, G., & Moorehouse, M. (Eds.) (1988). *Persons in context: developmental processes*. Cambridge: Cambridge University Press. The various contributors to this volume set out to show how the course of individual development is related to different environmental contexts, ranging from conditions affecting society as a whole to immediate interpersonal situations.

Gauvain, M. (2001). *The social context of cognitive development*. New York: Guilford. A detailed and persuasive argument for the need to take account of the social context in which cognitive growth occurs.

Light, P., & Butterworth, G. (Eds.) (1992). *Context and cognition*. London: Harvester. A number of authors discuss why context needs to be considered when explaining children's cognitive behaviour and what is meant by 'situational cognition.'

See also individualism – collectivism; zone of proximal development