

**Chapters from
Educational Psychology**
(study material for the subject:
Educational Psychology)

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INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ



Univerzita Hradec Králové
Pedagogická fakulta

Background Information on the Subject

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Number of Direct Training Hours: FS 13/26 hours; CS 18 hours

Number of Self-study Hours: 18 hours

Prerequisites: The subject builds on Fundamental and Developmental Psychology.

Rules for Communicating with the Instructor: In person, by e-mail and based on pre-agreed consultations. Additional rules: Checking the quality of completed individual assignments and participating in an assessment test based on an application for consultation and the assessment dates specified in the Faculty Information System (STAG).

Introduction to the Subject (Summary)

The subject *Educational Psychology* has a permanent place within the system of pedagogical and psychological disciplines. It fulfils an integrating role within the context of one's studies. It contains standard themes: psychology of learning (theories of learning, types and styles of learning, learning conditions and transfer, psychological aspects of assessing the process of learning), psychology of family upbringing, and psychology of ethics.

Subject Objectives

The objective of teaching this subject is to equip the students with internally interconnected knowledge of educational psychology (including the mastering of the basic terminology) in connection with previously acquired and to-be-acquired knowledge of the pedagogical and psychological disciplines. In terms of skills, the subject graduate will be able to apply the acquired knowledge to him/herself (identification of one's own style of studying, competence in self-evaluation of one's own pedagogical performance, etc.) and will also be able to apply the acquired knowledge to the educational process, both in routine educational activities (diagnostics of the personality of the learners, their leadership primarily in institutions outside of teaching, support in looking for the optimal style of learning of one's clients) and in non-standard educational situations (equipping them with skills to cope with stressful and conflict situations).

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Requirements for Completion

The subject will be completed with a credit and an exam.

The prerequisite for awarding the credit is the fulfilment of (1) the criterion test, (2) seminar papers on assigned topics (individualised and joint), and (3) participation in managed consultations.

The content of the seminar papers is linked to topic no. 3 (Analysis of one's own style of study), no. 10 (Pedagogical and psychological characteristics of the pupil/learner), and no. 13 (Self-diagnostics of the pedagogue). The assignments will be specified in detail in a provided written outline.

The oral exam follows the tasks involved in gaining the credit and its intention is to verify the depth of acquired knowledge in its interconnection and association with the appropriate skills applicable in educational reality.

Rules for Consulting with the Instructor and for Work during the Course:

The instructor will perform two five-hour blocks of jointly managed consultations which will be used to present the first six topics in a time period corresponding to full-time instruction. In addition to this, individual consultations by e-mail and, if necessary, consultations in person will take place.

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1 The Subject of Educational Psychology

● Objectives

To introduce students to the subject of educational psychology, its structure and preferred approach, and to define its position within the system of pedagogical and psychological disciplines. To demonstrate the significance and effectiveness of studying it for pedagogical staff and to motivate students to have a responsible and active approach towards this discipline.

● Time Demands

2 hours

● Terms to Remember (Key Words)

The subject of educational psychology; the position of educational psychology within the system of pedagogical and psychological disciplines; educational psychology as an applied, borderline and autonomous psychological discipline; the content of educational psychology; the significance of studying educational psychology.

1.1 Various Definitions of the Subject of Educational Psychology

Below you will find multiple definitions of educational psychology so as to be able to consider its content more thoroughly.



Educational psychology is a psychological discipline that uses psychological knowledge for effectively rooted progress in learning, training and education; it helps teachers determine educational goals and choose learning methods. (Hartl and Hartlová, 2010, p. 472)

Furthermore, Hartl and Hartlová point out that the first three-volume text on educational psychology was published in 1911 by the American psychologist E. L. Thorndike.

The same authors cite Nakonečný (1997) who suggests that pedagogical activity without psychological knowledge is *impossible*, as it investigates the relations between cognitive and social learning and between emotional and cognitive development, the social conditions of learning, the peculiarities of groups of learners, the influence of formal and informal learning on the development of personality, and the influence of teachers on the process – all this with regard to the autonomy of the learner.

Průcha, Walterová and Mareš (2003) say that educational psychology is

one of the oldest applied scientific psychological disciplines. A relatively independent discipline of psychology which receives stimuli from psychological and non-psychological disciplines, integrates them, reconstructs them and uses them in pedagogical practice. It offers a psychological view of the prerequisites, progress and results of an individual's development (especially his/her personality) and group development (pupils, teachers, educators, family, teams) in pedagogical situations. It emphasises the investigation of the individual and group within the social context and the content aspects of learning and teaching. It fulfils three functions: explaining, influencing and leading practice, and creating projects. (p. 156)

Kolář et al. (2012) arrive at a more narrow definition, characterising educational psychology as a borderline discipline

whose subject is the psychological processes activated and affected by the processes of upbringing and education. It analyses the processes of learning,



especially guided learning, and the processes which take place during learning activities. (p. 95)

1.2 The Position of Educational Psychology in the Structure of Psychological Disciplines

Where does educational psychology belong as a scientific discipline? The answer is sought by Mareš in *Pedagogická psychologie* (2013, pp. 13–14). He says that educational psychology is categorised among (1) the psychological sciences in the majority of European countries (including the Czech Republic and Slovakia), the United States, Canada and Australia, while it is included among (2) the pedagogical sciences in Germany and the Scandinavian countries.

In *Pedagogická encyklopedie* (p. 702), Mareš builds on the aforementioned and provides definitions by American authors which, according to him, are characterised by 'simplicity': 1) Educational psychology is a discipline which applies scientific methods when studying the behaviour of people under pedagogical conditions (Berliner); 2) It is a discipline that gathers psychological knowledge relevant to upbringing and education; it is applied in order to improve the quality of the educational process and its results (Sternberg, Williams, 2002).

A more general definition says that educational psychology 'systematically investigates the individual in the context of the entire educational reality' (Mareš, cited in Průcha, 2009, p. 702). The same author provides an older definition by Ďurič who defines educational psychology as a science of the psychological rules of the educational process in school and out-of-school facilities (cited in Průcha, 2009, p. 702).



1.3 The Content of Educational Psychology

The content of educational psychology – i.e. what educational psychology deals with – can be derived from the content of textbooks on educational psychology.

In the latest textbook by Mareš, *Pedagogická psychologie*, we can find these seven chapter titles: 1. The discipline and its transformation; 2. The social context of the school, upbringing and education; 3. Learning and teaching; 4. The requirements placed on pupils; 5. The content aspect of learning and teaching; 6. The main participants (sub-chapters: Teacher, Pupils, School class and Psychosocial climate of a school class); and 7. The school.

In classic textbooks on educational psychology published in the United States, great attention is also paid to developmental theories of learning (Erikson, Piaget, Kohlberg) and to classic theories of learning (Pavlov, Thorndike, Skinner) (see Slavin, 1988; Woolfolk, 1987, Sprinthall and Sprinthall, 1990).

Our approach focuses on five basic thematic units; after defining the subject of educational psychology, attention is given to the psychology of learning and the psychology of education, and then to the participants in the process of education, namely the psychology of the pupil (the learner) and the psychology of the teacher (the educator).

1.4 The Importance of Studying Educational Psychology

Studying educational psychology enables one to connect the knowledge acquired during one's studies of other pedagogical disciplines (pedagogical propaedeutics, instructive practice, general didactics, and educational theory) with the psychological disciplines (fundamental and developmental psychology, personality and social psychology). In the case of teaching studies, the subject



matter of educational psychology builds on the instruction of field-related didactics and one can also find that the content builds on some topics from special education.

As regards the students, successful instruction means that they can functionally interconnect their theoretical knowledge with their own experience. The synthesising role of the instruction of our subject is of key importance for the preparation of students for the state examination and subsequently for their successful beginnings as pedagogues.

● Summary

Educational psychology (EP) investigates the psychological aspects of the process of upbringing and education. This investigation applies to the educational process regardless of where it takes place: in school, in out-of-school facilities, in the family, in interest groups, or in corrective institutions.

It is a psychological discipline that enables one to use psychological knowledge for effectively rooted educational progress.

The position of EP in the system:

- 1) EP as an applied-science discipline → application of psychology to the area of upbringing and education; similar to medical psychology, traffic psychology, etc.
- 2) EP is a borderline discipline between pedagogy and psychology.
- 3) EP is an autonomous discipline (an uncommon approach in our country; in the Anglo-Saxon world, psychological knowledge is naturally integrated into textbooks for pedagogues without strictly discerning what is more pedagogical or more psychological (see textbooks such as *Educational Psychology, Teaching and Learning*, and Fontana's *Psychologie ve školní praxi*, which has finally been translated into Czech).



Our approach is a compromise between the Czech (or Czechoslovak) approach and the Anglo-Saxon approach.

● Practical Application of the Subject – Tasks and Activities

Look for and compare the content of textbooks on educational psychology and try to get an idea of the development trends up to the present.

● Review Questions

- 1) Compare various approaches to the subject of educational psychology. Look for similarities and differences.
- 2) Give examples of the application of psychology to various fields and areas based on your own experience.
- 3) Provide a general substantiation of the importance of psychological knowledge for the performance of the pedagogical profession.

● Literature

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2 Psychology of Learning

● Objectives

The objective of this chapter is to define the term 'learning' more narrowly and more broadly and to introduce students to the basic theories of learning. Among them, we include theories based on associationism, behaviouristic theories of learning by conditioning, theories of learning of Gestalt psychology, and cognitive theories associated with cognitive personality development. The reader will learn about persons closely connected to educational psychology and will acquire the knowledge needed for basic orientation in the theory of educational psychology.

● Time Demands

5 hours

● Terms to Remember (Key Words)

Learning more broadly and more narrowly; knowledge; skill; habit; laws of association; capacity of short-term memory; H. Ebbinghaus; forgetting curve; conditioned and unconditioned reflex; I. P. Pavlov; reflex arc; classical conditioning; instrumental conditioning; operant conditioning; B. F. Skinner; J. B. Watson; E. L. Thorndike; method of breaking bad habits; Gestalt; insight; aha! effect; Gestalt laws; W. Köhler; K. Lewin; J. Piaget; assimilation; accommodation; schemes; sensorimotor stage; circular reaction; pre-operational stage; symbolic thinking; egocentrism; centration; irreversibility; concrete operational stage; grouping; classification; formal operational stage; abstraction.

2.1 The Term 'Learning'



There is general agreement that the term 'learning' (or the 'process of learning') is one of the key terms in psychology. The Pedagogical Dictionary (*Pedagogický slovník*) states that there are dozens of theories of learning, and thus dozens of definitions of this term (Průcha, Walterová, Mareš, 2003, p. 259).

The *Encyclopedia of Educational Psychology* (2008, pp. 573–574) states that 'human learning has been the focus of organized study for many decades, and the results of this work have become ever more important as societies intervene on so many levels to promote and influence learning'. It goes on to say that today there is no single way to define learning. Over the past sixty years, three major conceptual frameworks have emerged and these will be used as the framework to define human learning. The first framework looks at learning as 'any relatively permanent change in human behaviour that is not the result of normal growth or maturation' (2008, p. 573). Similarly, Sprinthall and Sprinthall (1990, p. 633) claim that 'learning is a very general term referring to a process that leads to a relatively permanent change in behaviour resulting from past experience'. They therefore include in it such activities as acquiring physical skills, memorising a poem, and forming attitudes and prejudices.

The second framework to define human learning appeared at the end of the 1960s and the beginning of the 1970s. This trend, known as the 'cognitive revolution' (2008, p. 574), widely developed around the topic of memory and its functioning with regard to the manner of acquiring knowledge, understanding the spoken and written word, etc. In other words, it is about learning as a cognitive activity.

The third framework to investigate human learning is associated with the beginning of the 1990s. Contrary to the cognitive framework in which learning is defined in terms of being an enumeration of acquired information, the third framework focuses more on how people learn and work within a cultural



context. Thus, learning is defined not as the acquisition of knowledge, but as participation in a meaningful joint activity.

Kulič (in: Průcha, Walterová and Mareš, 2003, p. 259) offers a more complex definition: 'Learning is a mental process which, in a unity of physiological and psychological prerequisites, represents a decisive factor in people's adaptation to their natural and social environment, in the development of their personalities, and in the ever-improving mastering and organisation of the conditions of their individual and social existence.'

The following, more narrow psychological definition represents a contrast to the previously provided pedagogical one. Learning is 'an active process that expands the innate genetic programming and possibilities of the individual; its purpose is to enable adaptation to new situations' (Hartl and Hartlová, 2010, p. 632).

It needs to be pointed out that changes in the psyche can be caused by a host of influences: the process of maturation of the body and neural structures, ageing, disease, and transient mental conditions (such as exhaustion), but also by intoxication, etc. And, of course, by experience.

According to Nakonečný (1997, p. 359), changes caused by experience are known as 'learned' or 'acquired'. The term 'learning' thus expresses the influence of experience on a change in the psyche. Experience thus fulfils an adaptive function.

Woodworth and Schlosberg (1959, cited in Nakonečný 1997, p. 359) state:

Learning includes much more than deliberate learning by heart and training ... Learning is not one specific type of activity. It is a change that appears in the organism during many types of activity. A later activity is different as a result of a previous activity ... Learning manifests itself every time a later activity shows



some subsequent effect of a previous activity ... Learning creates relatively permanent subsequent effects.

Ernest H. Hilgard (1904–2001) and Donald G. Marquis (1908–1973) (cited in Hyhlík and Nakonečný, 1973) understand learning as fundamental changes in individual behaviour that depend on previously gained experience in a given situation.

Burrhus Frederick Skinner (1904–1990) thinks in a similar manner: Learning is the creation of a new manner of behaviour.

Conway Lloyd Morgan (1852–1936) states: Learning is a permanent change of behaviour resulting from past experience.

For practical pedagogical reasons, we also define learning more broadly. In this view, learning is a process of acquiring new experience and of applying it in new situations; it is a process of organising behaviour using past experience. It can be spontaneous, but also deliberate. We understand it as the basic form of existence of an organism and the acquisition of new forms of behaviour during one's life. In the most general meaning of the word, the result of learning is experience. In this concept, learning is characteristic of humans, but also non-human organisms.

Defined more narrowly, learning is a deliberate and managed activity characteristic of humans only and its objectives are to acquire knowledge, skills and habits and to deliberately form the opinions, attitudes and properties of the learner. More narrowly, learning is a dominant activity in the period from the beginning of one's schooling to completing systematic education at the primary-, secondary- or higher-education level.



Sets of knowledge, skills and habits (a habit is an automatically performed skill) represent the result of both more narrowly and more broadly defined learning. Psychological processes, conditions, opinions, attitudes and personality properties also develop through learning.

According to Hartl and Hartlová (2010, p. 656), knowledge is 'retained information including an understanding of the relations between pieces of information in the form of terms, rules, laws and patterns'. It is information acquired by learning.

Skill is 'a disposition acquired by learning towards correct, rapid and economical execution of a certain activity using an appropriate method'. Hartl and Hartlová (2010, p. 108) divide skills into intellectual, sensorimotor, motor and social. Very often, skills are supported by knowledge and build on one's knowledge.

A habit is an acquired tendency to execute a given activity in a certain – similar, identical – way. These often include automatically performed tasks. The inability to act as we are used to is perceived with displeasure. The urge to act habitually thus contains an internal motivational charge.

'Bad habit' is a lay (colloquial) term for a negative habit.

Summary:

The term 'learning' → a formative process where the individual gains experience during his/her life:

- acquired is the opposite of innate;
- learning is closely associated with activity (a person learns through each activity: work, sports, playing a musical instrument, and any other activity);
- learning affects all types of psychological phenomena (to varying degrees);



- psychological processes (cognitive, emotional and volitional processes) develop through learning as do psychological conditions, primarily social relationships, properties, abilities and character.

From the pedagogical point of view, it is very useful to distinguish between learning defined more broadly and learning defined more narrowly.

2.2 Theories of Learning

According to Hartl and Hartlová, theories of learning can be divided into two very broad categories: a) S-R theories, i.e. more or less exogenous theories, and b) cognitive, endogenous theories. Another categorisation: behavioural, cognitivist, social and humanistic theories. For the purpose of this text and from a practically pedagogical view, we will make a more detailed introduction of associationism, theories of learning based on the concept of conditioning, and the learning of Gestalt psychology. Subsequently, special attention is paid to Jean Piaget's theory of cognitive development.

2.2.1 Associationism

Associationism was originally a philosophical school in the 17th and 18th centuries (J. Locke, D. Hume, J. S. Mill) according to which everything in the psyche originated according to the famous sentence 'Nothing is in the mind that wasn't first in the senses.' In particular in the 19th century, this approach significantly contributed to the determination of what a psychological phenomenon was, thus providing the first foundations for the birth of psychology. It allows for the explanation of the psyche with the help of further unreducible mental elements, so-called associations. Its representatives include J. F. Herbart (1776–1841), H. Ebbinghaus (1850–1909), and F. Galton (1822–1911).

In psychology, association involves the combining of mental content. It was already Aristotle who pointed out that one idea (mental content) follows another which is similar to it or opposed to it or one that occurred in the past



simultaneously with the other. Based on these principles, he formulated three primary laws of association: similarity, contrast, and spatial or time relations. Some associationists reduced them to a single primary law of contiguity in time and space (D. Hartley, H. Spencer). David Hume 'added' the principle of causality (cause and effect). Mental content was different for the respective authors. Spencer considered them relationships, Herbart ideas, and Mach sentence (Hyhlík and Nakonečný, 1973, p. 11).

J. F. Herbart arrived at the opinion that conflicting ideas subdue each other and fall below the threshold of consciousness; like ideas merge; and ideas that do not contradict themselves associate.

Philosopher T. Brown introduced the so-called secondary laws of association in 1810. The first five are based on duration, liveliness, frequency, recency, and reinforcement by other ideas, while the remaining four are related to the personality of the perceiver: his/her constitution, moods, physiological relationship and living conventions (Hartl, Hartlová, 2010, pp. 686–687).

In contemporary psychology, the term 'association' is understood more broadly. One does not understand it only as a combination of ideas, but also as the creation of so-called temporary connections (see 'classical conditioning' further in the text) and the behaviourist S-R model.

The most important representative of associationism was the above-mentioned Hermann Ebbinghaus (1850–1909). Sprinthall and Sprinthall (1990, p. 212) deservedly call him 'the father of the psychology of learning'. They point out his effort to investigate learning in 'pure form'. To achieve this objective, he used sets of so-called nonsense syllables, e.g. 'snarp', 'bluck', etc., i.e. verbal units unburdened by previous experience or other possible influence (as if learning started from scratch). He investigated the range of short-term memory (*method of underlined elements*) after a presentation of a row of syllables. (There is also



a visual form of investigating the range/capacity of short-term memory in the form of Kim's games.) The task of the participant in the experiment is to repeat as long a row of syllables as possible in the correct sequence and without errors. Atkinson states the surprising fact that the capacity of short-term memory is very limited. Some people retain five items, others up to nine (7 ± 2). This is a certain constant that has been repeatedly confirmed in other experiments. Atkinson cites Miller who in this connection speaks of the 'magical number seven'.

The second method applied by Ebbinghaus was the *method of repetition*. He looked into how many repetitions were possible with regard to the reproduction of a row of syllables (or other content) without mistakes. Even here one sees very significant differences among individual people.

The *method of savings* enabled Ebbinghaus to prove that during the re-learning of an identical row of syllables one can 'save' several repetitions compared to a situation where we learn the syllables for the first time. For instance, during the first learning session I need 10 repetitions for the error-free reproduction of 12 syllables; when I learn the same after some days or weeks I only need five repetitions. In this case, the savings amounts to five repetitions. In practice, the 'second' and subsequent learnings of identical content primarily save time. In other words: we never really forget something we have learned.

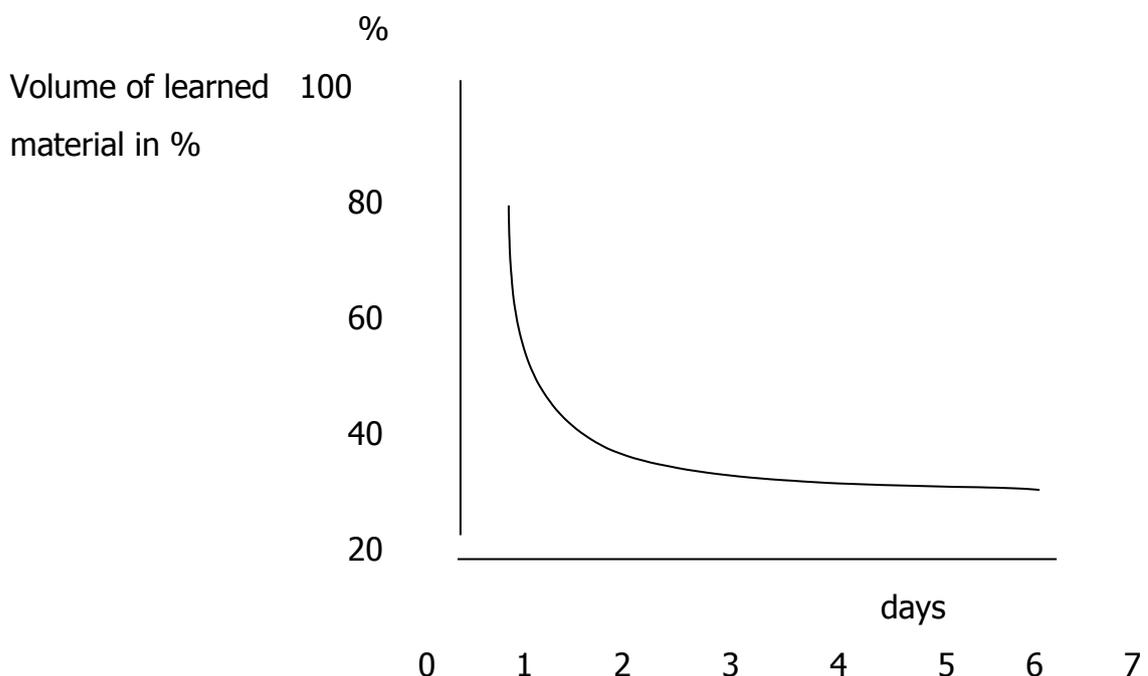
Sprinthall and Sprinthall see the contribution of Ebbinghaus's experiments in two basic aspects:

1) We forget something we once learned in an irregular time mode. We forget the majority of the learned material very quickly (within hours) and the rest then 'disappears' more slowly and tends to be retained longer (see Ebbinghaus's retention/forgetting curve). Hartl and Hartlová (2010) provide other labels under which Ebbinghaus's famous curve can be hidden: the



remembering/learning curve. They claim that this curve has only a historically methodological significance today, because each instance of forgetting depends on a host of variables: the motivation of the learner, his/her age, the 'training' of his/her memory, previous experience, the current state of his/her psyche, the content of learning, the used method of learning, the number of repetitions, the spatial and time conditions, etc. Its credibility is significantly higher with regard to so-called mechanical learning (memorisation).

The Forgetting Curve (H. Ebbinghaus)



2) For a person to learn new material, it is more efficient to learn in shorter parts than in one go without a break.

Summary:

Associationists understood learning as fortifying associations and their retention in memory and emphasised the receptive aspect of learning and repetition/memorisation. As was said above, H. Ebbinghaus (1885) was an important representative of the associationist theory. Through associations, he



tried to explain the entire complexity of mental processes. Gradually it became apparent that the associationist theory was not enough to explain mental processes. Associationists had a mechanical approach to the explanation of mental processes. They did not take into account an individual's activity during learning, his/her motivation, etc. In spite of this, Ebbinghaus's experiments were of great importance, because for the first time human learning and the process of memory were subjected to systematic investigation.



2.2.2 Theory of Learning by Conditioning

The starting point of so-called classical conditioning, represented by the Russian physiologist and psychologist Ivan Petrovich Pavlov (1849–1936), was the study of the physiology of higher nervous activity. Here we arrive at a key term, 'reflex', which Hartl and Hartlová (2010, p. 491) define as 'an automatic, innate, involuntary or acquired-by-learning reaction to external or internal stimuli without conscious participation'. It is a response of the organism brought on by the nervous system.

Reflex is essentially represented by the movement of a nerve impulse that is caused in a receptor by a stimulus and that moves in centripetal pathways to the centre and from there to an effector. This pathway along which the impulse moves is called the reflex arc.

Expressed schematically:

P → R (IMPULSE) – AND → CNS → (PROCESSED IMPULSE) – END → E →
O

Reflex arc

P – stimulus

R – receptor (sensor, received excitation)

AND – afferent nerve, centripetal pathway leads impulse to CNS

CNS – information processing (brain, spinal cord)

END – efferent nerve from CNS, centrifugal pathway

E – effector (executive organ; muscles, glands)

O – response (reaction of muscles and glands)

I. P. Pavlov distinguished two basic types of reflexes: unconditioned and conditioned. The organism is equipped with a set of unconditioned reflexes that



provide for its basic adaptation. Unconditioned reflexes are congenital; their course is pre-determined in the genetic code. They are caused by unconditioned stimuli.

Conditioned reflexes = learned, originating on the basis of connecting a so-called conditioned stimulus, which can be any originally indifferent stimulus (e.g. the sound of a bell), with an unconditioned stimulus (e.g. food). These reflexes are not congenital, but acquired; the organism acquires them during its life.

2.2.2.1 Classical Conditioning

In this kind of learning, a temporary connection is created on the basis of repetition. I. P. Pavlov (1901) found that if some signal, e.g. the sound of a bell, was presented at the moment food was served to a hungry dog and was repeated several times, the dog started to salivate even upon hearing the signal (sound) itself. A conditioned (temporary) connection was created between the sound and the salivating, which was a new component of behaviour. The conditioned-reflex method of learning includes terms such as extinction, the process of generalisation and differentiation (discrimination), and the second signal system.

An unconditioned stimulus is that which causes an organism to react independently. For instance, with Pavlov, food was an unconditioned stimulus for the dog and salivating was the subsequent unconditioned reaction.

A conditioned stimulus itself does not cause any salivating reaction (light, the sound of a bell), but if we connect it closely with an unconditioned one (food), an originally neutral stimulus will cause this salivating reaction after a certain number of repetitions. With regard to the fact that it is conditioned, it must be strengthened (facilitated) from time to time with the presence of the



unconditioned stimulus (food) so that it does not become extinct (extinction, inhibition).

Types of inhibition:

- external (external disruptive stimuli, e.g. noise);
- internal (extinction of the temporary connection, tiredness, sleep);
- differentiated (when conditioning a dog, one has to differentiate a certain tone from others by strengthening the selected one with food; through repetition, we will achieve the occurrence of a salivating reaction when the tone is strengthened, but not with other tones);
- unconditioned (congenital);
- conditioned (acquired, created during an individual's life).

Classical conditioning scheme:

1) before conditioning (so-called unconditioned reflex)

US	→	UR
food in mouth		salivating

US	→	UR
light, sound		orientation reaction

2) during conditioning

US	+	IS	→	UR	US + IR	x times together until IS becomes CS
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food		light, sound		salivating
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3) conditioned reflex (temporary connection)

CS	→	CR
light, sound		salivating

Description:



US = unconditioned stimulus (food)

UR = unconditioned response (salivating)

IS = originally an indifferent (neutral) stimulus in relation to salivating (bell or light)

CS = conditioned stimulus (bell or light)

CR = conditioned response (salivating)

So that the temporary connection (conditioned reflex) does not become extinct, we must strengthen it.

According to Hyhlík and Nakonečný (1975, p. 203), a conditioned reflex originates under the following conditions: 1. a conditioned stimulus must precede or must act together with an unconditioned stimulus; 2. the connection of an unconditioned stimulus with a conditioned stimulus must be repeated; 3. the unconditioned stimulus must be biologically more important than the associated conditioned stimulus; 4. the brain must be in optimal condition for activity (the individual is not tired).

2.2.2.2 Instrumental Conditioning

Edward Lee Thorndike's (1874–1949) starting point was trial-and-error learning. This kind of learning is based on a random (trial) search for the right solution. If one is found, reinforcement (strengthening of the successful response) occurs as does a tendency to repeat this response under analogous conditions. On the other hand, previous responses that are unsuccessful and do not lead to the objective or to the satisfaction of a need are eliminated. The basis of this learning is an instrument – a tool to obtain a positive effect represented by the newly learned response. We learn such behaviour which is followed by the achievement of a desired goal.



Together with trial-and-error learning, Hartl and Hartlová (2010, p. 636) also include operant learning under 'instrumental learning'. Operant learning is connected with Burrhus Frederic Skinner (1904–1990), who belongs among the neo-behaviourists (see further in the text).

Whereas the organism is passive in classical conditioning situations, it is active in instrumental conditioning situations. This can be illustrated by Thorndike's famous experiment with a cat in a puzzle box (1898). A hungry cat is placed inside a puzzle box whose door is closed with a simple latch and a piece of fish is placed in front of the puzzle box. In the beginning, the cat tries to reach the food by putting its paws through the bars of the puzzle box. When it fails, it starts to move around the puzzle box randomly and rather chaotically. At a certain moment, it touches a lever, the door opens and the cat eats the fish. The experimenter then puts the cat back into the puzzle box and puts another piece of fish outside. The cat behaves in a similar fashion until it succeeds in opening the door (randomly) and eating the fish. This procedure is repeated again and again. Once the number of attempts reaches a certain level, the cat gradually discards such (erroneous) behaviour that does not lead to its objective until it finally learns to touch the lever to get to the food immediately after it is placed inside the puzzle box.

According to Thorndike, trial-and-error learning is applied here: if an immediate reward follows one type of behaviour, this behaviour is reinforced and tends to be repeated. According to him, this type of reinforcement follows the *law of effect* (adapted according to Atkinson et al., 1995, p. 278).

E. L. Thorndike defined three laws of successful instrumental learning: a) the law of effect, b) the law of exercise, and c) the law of readiness. The essence of learning is connection, i.e. a connection between a situation (stimulus) and a correct response (the S-R model). A connection is created on the basis of an internal readiness to learn.



- a) The main law is the aforementioned law of effect. The positive effects of behaviour leading to the satisfaction of a need reinforce the connection between the stimulus and the response, whereas negative effects weaken the connection.
- b) The law of exercise – according to it, connections are reinforced by use and weakened by disuse.
- c) The law of readiness – related to motivation; the readiness to act and the need to act condition the effort towards a good performance; unmotivated activity leads to the opposite (a sated cat will not make an effort to get to the food, and thus will not learn to open the puzzle box).

Thorndike applies the principles of instrumental conditioning in a school environment. If a pupil gets an A for his/her effort, he/she gets feedback, a 'guideline' that his/her analogous efforts will be successful next time as well. If a pupil, despite making an effort, gets an F, he/she finds that the invested effort did not bring the desired effect and was in vain and that this is not the path to follow. However, he/she does not receive any guidelines on how to proceed effectively. In this case, the feedback says 'not this way' but does not say what the correct way is.

Classical and instrumental conditioning compared:

- 1) Classical conditioning causes autonomous responses and depends on the contiguity of the conditioned reflex in time; instrumental conditioning causes responses from the musculoskeletal system and depends on the effects of the organism's behaviour.
- 2) Classical conditioning is about a passive response (an animal is fixed on a stand and its movement activity is of no significance to the experiment); instrumental conditioning is about an active response (an animal can run around and e.g. move a lever that gives it access to food; the animal reaches its objective thanks to its movement activity).



- 3) In instrumental conditioning, Thorndike's cat learns a new response (to open the box using a lever) and Pavlov's dog learns to salivate in response to a new stimulus (original response – new stimulus).
- 4) Pavlov's and Thorndike's experiments were performed at approximately the same time, but they both formulated their concepts independent of each other (they discovered simple moments in the complex process of learning → the S-R (stimulus-response) connection for Thorndike and the conditioned reflex for Pavlov).

Thorndike's concept is peripheral, but Pavlov's is central, i.e. the cognition of nervous processes that occur in the nerve centres (for more, see e.g. Nakonečný, 1997).

2.2.3 J. B. Watson's Principles of Behaviourism

Another important personality in the field of psychology at the beginning of the 20th century was the American John B. Watson (1878–1958), founder of behaviourism and author of *Psychology as the Behaviorist Views It* (1913). Influenced by Bekhterev and Pavlov's reflexology, he determined that only observable behaviour can be the subject of investigation and not experience, which in its essence cannot be objectively assessed. According to him, the task of psychology was to study the relationship between the objectively registrable or observable responses of an individual and the stimuli that cause them (S → R theory – stimulus and response).

What an individual learns is determined by the environment and thus anything can be learned – using the proper procedure. This is illustrated by this famous sentence: 'Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select – doctor, lawyer,



artist, merchant-chief or, yes, even beggar-man or thief, regardless of his talents, penchants, tendencies, abilities, vocations, and the race of his ancestors' (cited in Hartl and Hartlová, 2010, p. 632).

Learning follows the law of recency and the law of frequency. The newer the stimulus-response (S-R) relationship, the more probable it is that another stimulus will cause the same response; the more often a certain response to a certain stimulus occurs, the more probable it is that it will occur in the future.

The behaviourists were not interested in investigating the personality, but instead focused only on what could be objectively measured. This fact is illustrated by Watson's famous 'Little Albert' experiment: *Little Albert was a nine-month old boy who became the subject of a conditioning experiment. J. B. Watson and R. Rayner found that he showed no fear of rats, but showed fear when a hammer hit a suspended steel bar. Over a two-month period they placed the rat closer and closer to the child while hitting the bar. Gradually, a fear response to the rat occurred that subsequently transferred to other furry objects (cotton balls, plush toys, a Santa Claus mask, etc.).*

Gradually the radical S-R model was abandoned and the neo-behaviourists – E. C. Tolman (1886–1959) and C. L. Hull (1884–1952) – replaced it with the S-O-R (stimulus-organism-response) scheme where the resulting response is a function of the stimulus effect and the reaction of the organism (intervening variable): $R = f(S, O)$.

Behaviourism summarised:

- representative: J. B. Watson;
- if psychology wants to be a scientific discipline, it must investigate verifiable things;
- the S-R (stimulus-response) model: what is between them cannot be verified;



- it ignored the investigation of experience;
- non-transferability of the subjective; what is inside us is difficult to investigate;
- extrospection = external observation;
- J. B. Watson preferred two laws of learning: the law of frequency and the law of recency.

2.2.4 B. F. Skinner's Behaviourism

Thorndike's conditioning research was further developed by B. F. Skinner (operant conditioning). For his experiments primarily with pigeons and rats he used a special operant conditioning chamber which was empty except for a lever on the inside and a food dispenser placed underneath it (also known as Skinner's box). After the rat pressed the lever, a food tablet dropped into the dispenser. The food reinforced the pressing of the lever and the number of presses of the lever increased dramatically (again applying the feedback law of effect). On the other hand, if the food was disconnected from the mechanism and stopped dropping into the dispenser after the lever was pressed, the number of presses of the lever declined significantly (extinction of the conditioned reflex) (see Atkinson et al., 1995).

Skinner distinguished two types of behaviour:

respondent – reactive behaviour caused by a controllable stimulus;

operant – behaviour is a means toward the achievement of an objective and is conditioned by internal needs. Operant behaviour is conditioned by consequences and a connection is created between the response and reinforcement, whereas in E. L. Thorndike's instrumental conditioning the reinforcement augments the connection between the stimulus and response.



Skinner distinguished between the reinforcer and reinforcement. The reinforcer is what causes reinforcement.

Types of reinforcement:

positive reinforcement – a reward is given;

negative reinforcement – removal of a disruptive stimulus;

continuous reinforcement – each correct response is reinforced;

interrupted reinforcement – the reinforcement of only some correct responses;

combined reinforcement – various combinations of the aforementioned types.

Skinner is the author of programmed learning, which he developed on the basis of operant conditioning. Programmed learning is based on feedback, self-teaching controlled by the learner, and on gradual approximation, i.e. gradual guidance towards the final objective.

Programmed learning is based on four fundamental principles:

1. Principle of active answers: an active answer is retained better and the learner continues to work actively.
2. Principle of small steps: in accordance with the principle of gradual approximation, the difficulty between the known and as yet unknown is scaled so that the differences are as small as possible; the learner has the possibility of advancing towards the objective fluently and quite quickly, step by step, more or less only through giving the correct answers.
3. Principle of gradual rewards: there should be no answer without reinforcement; the continuous reinforcement of what is learned through positive feedback maintains attention and positive motivation.
4. Principle of individual pace: the learner should have the possibility of advancing in his/her work at his/her own pace.

Types of programming:



- linear programming – a straight line towards the objective
- branching programming – a deviation to provide missing information on the subject matter
- leap-enabling programming – for advancing more quickly

Summary:

B. F. Skinner. His starting point was that behaviour consisted of operant elements, as he called them. These elements are produced by the organism as spontaneous responses to undifferentiated stimuli. The driving force behind learning is reinforcement.

Positive reinforcement is a reward, and negative reinforcement occurs when a disruptive stimulus is removed from an organism's reach. If some operant is reinforced, the probability of its repetition increases. This is the theory of operant conditioning. Each random movement by an animal can be perceived as an 'operant'. When we reward this movement, we create operant conditioning. When an experimenter modifies a sequence of small, random movements one after the other, he/she can shape the animal's behaviour until he/she leads it toward conduct that was not part of its original or natural abilities (a pigeon learns to 'dance').

2.2.5 Guthrie's Methods of Breaking Habits

Edwin Ray Guthrie (1886–1959) believed that all learning was based on contiguity (theory of contiguity). The contiguity of the stimulus situation and the response is a decisive condition for the creation of a connection. Learning is thus a consequence of an association between a certain stimulus and a response. Guthrie claims that rewards and punishments do not play a significant role in learning, as they appear only after an association between the stimulus and the response is created. According to him, exercise and repetition are of no significance. He was a proponent of one-trial theory. A connection is



either created or not. If a child learns to put something together, to solve something, he/she repeats it. If he/she learns *not* to put it together, he/she does not want to repeat it and refuses to deal with it. The final output experience is important.

Guthrie's methods of breaking habits

Guthrie was convinced that a habit, which is essentially based on an automatic behaviour (a more or less dynamic stereotype) built on an internal (urge) need, cannot be removed, but only replaced by another activity (deviation, re-direction, reconstruction of the stereotype).

- 1) The **threshold method** is about re-directing a habit (negative dynamic stereotype). Guthrie illustrates this with an example of a mother having a problem with her adolescent daughter who has a tendency to throw her coat somewhere and not hang it. It is necessary to change this habit. The mother does it by forcing the daughter to take her coat off at the door (deviating from the stereotype at a certain point). After entering the flat with the coat in her arms, it is easier for the daughter to hang it.
- 2) The **fatigue method** – despite being forbidden to do so, a small child has a tendency to take matches and light them. The application of the fatigue method is based on the child being provided with the opportunity to light the matches (under parental supervision) until he/she has had enough and on him/her being forced to do so even though this activity has long lost its attraction. It is about putting the child off the activity of lighting matches so that next time he/she will not even feel like reaching for the matches. In a similar manner, a block is created as a result of the 'last' negative experience associated with some kind of spoiled food, alcoholic beverage, etc. Sometimes this represents a life-long block.
- 3) The **incompatible response method**, or better said, the originally incompatible stimuli method. As an example we can use the situation of a boy who is used to studying in his room without interruption while at primary school. He transfers to a secondary school and lives in a



dormitory where he has completely different 'disruptive' conditions for learning. Gradual adaptation to the new environment can happen in steps: from gradually managing in a focused manner to read the daily newspapers, then a magazine, followed by literature, until he is able to concentrate on learning from a textbook.

2.2.6 Gestalt Theory of Learning

Gestalt psychology originated in Germany based on a critique of the associationist explanation of the psyche, on the rejection of the universality of trial-and-error learning, and on the rejection of the behaviourist approach focused only on investigating behaviour.

Max Wertheimer (1880–1943), a German psychologist born in Prague and active in the United States, is considered its founder. Other representatives, more or less psychologists of German origin who immigrated to the United States after 1933, include

Wolfgang Köhler (1887–1967), Kurt Koffka (1886–1941) and Kurt Lewin (1890–1947). Gestalt psychology is based on the holistic understanding of the mental processes.

The main thesis: Gestalt = form, organisation of parts and their structure. For Gestaltists, the whole is greater than the sum of its parts; the organisation of the parts into a whole and their structure and form are of significant importance. Perception is a holistic experience, occurring as an organisation of the stimulus field into certain forms and not as a mere reflection.

In the process of learning (cognition and problem-solving), an individual will include in his/her field of perception all elements of the situation in question and will understand their structure within a new context, in a new form, with



changes in the dominance and sub-dominance of parts occurring (re-centring or re-structuring of the perception field), resulting in a new structure, a new form = an increment in learning. When solving problems, a new structure is created by complementing the missing parts or relationships. Gestaltists call the moment when the missing relationships and parts are complemented an 'insight'.

An insight represents a sudden understanding of the relationship between the figure and the background, the means and the purpose, the cause and the effect, the part and the whole, etc. An insight is a sudden solution accompanied by a release of tension. An insight is referred to as the 'aha! effect'.

The effectiveness and speed of learning depend on the organisation of the cognitive structures in our brain, which are influenced by experience and the manner of submission and organisation of the material to be learned.

The law of good Gestalt is applied here (see also 'form primacy', Hyhlík and Nakonečný, 1975). We have a tendency to prefer concordant, harmonic and well-arranged forms and wholes.

For a more detailed characteristic of the tendency of people to shape their perceptions into the form of good Gestalt, the Gestaltists formulated a host of laws for the area of perception (in this regard, Hartl and Hartlová mention up to 100 laws of the functioning of the process of perception): a) law of closure: we have a tendency to perceive incomplete forms as whole; b) law of symmetry: we have a tendency to perceive asymmetrical forms as symmetrical; c) law of proximity: we group individual elements into certain forms; d) law of similarity: we perceive a grouping of similar parts as a whole; e) law of past experience: we perceive something that has already been a subject of experience as a whole; f) law of Prägnanz: incomplete and uncertain forms are perceived as



whole and certain; g) law of common fate: we perceive parts that have e.g. a common movement in one direction as a whole (2010, p. 687).

This conclusion is of fundamental importance for the substantiation of the significance of the didactical elaboration of the subject matter arranged as best as possible.

On the other hand, Gestaltists overestimate the possibilities of learning by insight when they believe that the aha! effect can occur without previous experience and even without thinking.

Wolfgang Köhler (1887–1967) elaborated on the theory of solving problems by insight. During WWI he was on the Spanish island of Tenerife where he was researching the perception and thinking of anthropoid apes. A chimpanzee called Sultan was confronted with a problem whereby a desirable object – a banana – was out of his reach (outside the cage or hanging high in the cage). There were two short bars (or two boxes) in his cage. The chimpanzee tries to get the banana by pushing his upper extremities through the bars (or by jumping up to reach the banana hanging above him), but he fails to reach it. After several attempts in vain, he stops this activity, but after a certain period of time he suddenly – through insight – ‘understands’ the relationships (restructures the field of perception) and this connection leads him to suddenly grasping a bar (or positioning the box) and getting the banana in this manner. He is even able to transfer the experience from one solution to similar situations (see a more detailed description of the experiment in Atkinson, 1995, pp. 253–255).

According to Gestaltists, the stage when the animal first tries various movements, manipulates bars, etc. is not important; the decisive moment is the gaining of insight into the situation, the connection of originally unrelated items (cage, banana, bars, boxes) into a structure, and the finding of a solution



(getting the banana). On the other hand, behaviourists explain this experiment as an example of trial-and-error learning.

Significance of the Gestalt theory of learning:

- According to holistic psychologists, it is not important for learning to create associations or S-R connections, to learn by conditioning, by trial and error or by mechanical repetition, but it is important to understand relationships and structures, to learn while understanding the context.
- Holistic psychologists contributed to an approximation or even a merger of the issues of learning and problem-solving.

Summary:

- Cognition and learning occur by perception, immediate inference and understanding how to resolve a new situation (AHA – I have suddenly got it = learning by insight, such as when doing crossword puzzles);
- The perception field has been restructured (something has changed in the structure, resulting in the solution being found);
- Learning by insight – the aha! effect – stems from the principle of Gestalt;
- Perception field restructuring – suddenly, independent of previous experience;
- According to Gestalt psychology, one can learn without previous experience, as previous experience is not important = SPOR → it is necessary to know something about it, to know that the aha! effect will occur;
- The possibility of insight will apply in situations in which individuals deal with the issue in question → necessary external and internal conditions for the aha! effect;



- Gestalt psychologists emphasise learning by understanding; we should learn everything in structures and within contexts; new subject matter should be integrated into existing structures;
- Good Gestalt → people prefer 'good Gestalts': harmonic, concordant, well-arranged Gestalts as opposed to un-good (the circle is the most perfect Gestalt, we prefer symmetrical and harmonic Gestalts);
- They considered structure to be of decisive importance and demonstrated it in the phi phenomenon.

2.2.7 Piaget's Theory of Cognitive Development

In the cognitive approach, learning is understood as an internal change in an individual's cognitive structures, a change in one's readiness and eligibility to respond to a particular situation. Its representatives were R. M. Gagné, J. Piaget and J. S. Bruner.

Cognitive development is related to the development of the cognitive processes during ontogenesis (from perception to thinking and language). The respected concept of cognitive development was developed and empirically verified by Jean Piaget (1896–1980). The genetic foundation of cognitive development is the organism's biological adaptation to the external environment. From it, more complex forms of creating a balance develop gradually, up to the level of hypothetical-deductive thinking.

According to Piaget, interaction between the organism (its maturation) and the environment is controlled by two mechanisms: *assimilation*, which on the biological level means the integration of external data into the organism's internal cycle, and *accommodation*, which is based on the organism changing under the influence of the environment. To psychologically assimilate an object



or a situation means to affect them and to change their properties or relationships, to integrate them into one's experience and to learn. The essence of psychological accommodation is the differentiation of activities imposed by one's external reality. According to Piaget, cognitive development in ontogenesis is characterised by the ongoing creation and breaching of the balance between accommodation and assimilation (Piaget and Inhelder, 1970, p. 7).

Through these processes, a child from an early age actively creates his/her own world of ideas: assimilation – a child integrates information into his/her already existing system of knowledge; accommodation – a child adapts him/herself to the new information.

Piaget does not understand a child's thinking only as the immature thinking of an adult, but as different in many aspects. According to him, these differences can be categorised in several stages through which the child moves on his/her path from an infant's thinking to the fully developed thinking of an adult.

According to Piaget, we pass through four stages of understanding the world in cognitive development. Each stage is characterised by a different, more advanced way of thinking (adapted according to Fontana, pp. 67–71).

1) Sensorimotor stage (0–2 years) – stage of sensorimotor intelligence

A child begins to discover the world through the co-ordination of sensory experience and motor activities, hence the term 'sensorimotor'. This co-ordination of the processes of perception and movement plays a dominant role in the cognition (it 'drives' cognition) of oneself and the world around roughly until the child turns two years old. With the onset of walking and speech in the next developmental stage (the pre-operational stage), thinking and speech begin to dominate the cognitive process.



In the first weeks of life, a child's activities seem purely reflexive. These include involuntary reflexive reactions such as sucking, crying, grasping, etc. At some time between four and eight months of age, the child begins to focus more and more on external objects.

Gradually, the element of purpose appears in the child's behaviour in the form of a sequence of movements focused on achieving a certain end. Piaget calls such sequences of movement 'schemas'. They become more and more complex, especially after the child turns 12 months old.

In the described stage, these schemas are determined by the child in essence by circular reactions. Piaget places them in primary, secondary and tertiary categories according to their complexity and sophistication. Here, Fontana emphasises that the term 'circular reaction' signals that these reactions are obvious and of a physical nature. The child does not think about what he/she is doing; he/she simply does it. He/she lives by what he/she does. Acts are not yet preceded by ideas.

At the end of this stage, the child develops object permanence, i.e. objects exist even if they are not perceived directly.

Walking and speech, a key milestone at about one year of age, is of key importance for the child's further natural development. Walking on his/her lower extremities enables the child to have his/her hands free to dynamically develop fine motor skills and to more thoroughly discover the external world.

2) Pre-operational stage (2–7 years), subdivided into the *symbolic function sub-stage* (2–4 years) and the *intuitive sub-stage* (4–7 years)



In the symbolic function sub-stage between the ages of two and four, symbolic activities apply more and more. Children already have the ability to use symbols to label objects, situations and their own acts. They can thus imagine something without actually doing it. This is shown in children's play, in which people are represented by dolls, etc. Symbolic thinking is higher than the connection of sensory information with a motor response, but the child still cannot perform mental operations. The child solves problems by manipulating objects.

With the development of speech abilities, children acquire symbols or sounds which, even though they do not have any relationship to labelled objects and situations, are used to represent them (the issue of various mother tongues).

Piaget considers it important to distinguish symbols from signs. Symbols precede the use of signs and gradually, as the vocabulary expands, both processes are connected. He called this stage of development the symbolic function sub-stage because children create terms on their own and differently from their elders and from adults. For instance, a child cannot create *generic terms*, i.e. classes (categories) of objects according to a substantial sign/substantial signs (e.g. a child calls all bearded men 'dad' based on his/her dad). The experience of going into town to see dad leads him/her to think that all buses transport people to see his/her dad (transductive reasoning: If A is connected to B, then B must always be connected to A). The child wrongfully narrows or broadens the term on the basis of superficial (conspicuous) attributes.

Piaget investigated the intuitive sub-stage the most. The main cognitive structures appearing in a child are:

- a) egocentrism – the inability to see the world differently than from one's own self-centred, subjective viewpoint. This is cognitive egocentrism, which prevents the child from considering things



realistically and from taking more points of view into account. This can be demonstrated through giving the child the task of describing what another person, e.g. on the other side of the room, sees.

b) centration – the child focuses his/her attention on one (usually conspicuous) attribute and omits the other ones, even though they might be more important. This phenomenon was illustrated by Piaget in a host of experiments (two balls of modelling clay are assessed by the child as equally large; when we then make a sausage out of one ball in front of the child and ask which is larger; the child usually points at the sausage). As a result of this centration on one attribute, the child is unable to apply what Piaget called 'conservation', i.e. that the amount of modelling clay remains the same regardless of the shape. Other experiments contained water and two rows of candies.

c) irreversibility – this is about the inability to return back to one's starting point. Even though a child can add 2 and 3 together and get the result of 5, he/she often cannot reverse the process and subtract 2 from 5 and get the result of 3. If this task is given to him/her as a separate task, he/she can calculate it. The connection (reversibility) of both calculation assignments in the sense that if 2 plus 3 equals 5, then 5 minus 3 must be two remains incomprehensible for the child for the time being.

3) Concrete operational stage (7–11 years)

This stage essentially covers the younger school-age period. There is a large advance compared to the pre-operational stage, also due to the systematic development of cognition at school. Children's cognition during this period is associated with their concrete experience. For their thinking they need the support of percepts and ideas.

Children are still limited in their thinking and tend to describe their environment instead of explaining it. They are good at 'explaining' a term using a concrete



example (peace is when one is not shooting), but not using a definition that expresses the term's essence. It is also difficult for them to verify hypotheses by comparing them with the facts: they often adapt their correct view of the facts to correspond with their expectations rather than changing their assumptions. If they are fans of some team, then they consider it the best in the competition, even though it keeps losing. (For that matter, adult fans also behave similarly.)

Still, children's thinking makes large advances. It becomes less egocentric; children are already capable of some decentring and simple reversible operations. With decentring, conservation appears which advances in certain steps: the ability to conserve a substance in one's mind appears at the age of seven to eight; the ability to conserve weight appears between nine and ten years of age; and the conservation of volume appears at around 12 years of age.

The main cognitive structure which is the basis of this developmental advance is classification (grouping). Children are able to identify the correct logical classes and thus can successfully classify objects and events into sets and categories according to their common defining attributes.

Together with classification, seriation appears. This is the ability to sort objects according to some attribute (size, weight, shape, etc.). The operations of classification and seriation enable the child to correctly perceive the relationships between objects and to use this cognition to solve concrete problems.

4) Formal operational stage (over 12 years of age)

Piaget connects the beginning of adolescence with the onset of the final stage of formal operations. A child's thinking begins to resemble an adult's thinking.



The child can formulate assumptions without his/her own experience being necessary. He/she categorises terms with more precision according to their main/substantial attributes. He/she is able to find mutual differences, concordances, dependencies and context between terms or classes of phenomena.

Piaget called the cognitive structure that forms the basis of formal operations a *grid-group structure*, which means that in this structure anything can be associated with anything else. We can call this type of reasoning hypothetico-deductive ('if – then'), because an individual is capable of creating hypotheses and making deductions from the results and thus of developing his/her understanding of the task or subject he/she is dealing with. Abstract thought is applied more and more.

Functional invariants – it is obvious that all of the processes described by Piaget depend on one's age and development. However, they also include other cognitive processes that are congenital. He considers accommodation, assimilation and organisation the most important.

Accommodation, a term borrowed from biology, expresses the fact that individuals have to adapt to the circumstances in which they are. Children are aware that there are many things in the world which they cannot change (e.g. the Earth's gravity or the properties of water and fire) and thus they must adapt to reality. Contrary to this, assimilation labels the processes through which objects or their properties are integrated into cognitive structures that already exist in an individual. During these processes, these structures are modified and developed. Assimilation and accommodation always happen together, and one of these processes can become more important and dominate (see Piaget and Inhelder, 1970; Fontana, 1997).



The reason why they appear together is that individuals are able to assimilate only such elements of the environment which they are able to become accommodated to. If accommodation is impossible, assimilation is impossible as well. For instance, children become accommodated to a substance such as water and during this process they assimilate the findings of some problem (water is wet; one cannot breathe it in; we can slip on it on the floor). (Fontana, 1997, p. 71)

The third of Piaget's functional invariants, organisation, applies to the manner in which cognitive acts are united and sorted into sequences and schemas. Any rational act always includes some schema, a cognitive plan (realised or unrealised), which an individual uses when coping with a problem. If it fails, an individual tries to re-organise this procedure (adds, removes, organises in another way, simply makes a correction, etc.).

Of course, the ability to organise as well as the ability to accommodate and assimilate develop with advancing age, but these three invariants fulfil their function in the cognitive development of an individual from birth to adulthood.

● Practical Application of the Subject – Tasks and Activities

Think about what theories and principles you have encountered over the course of your education. Write examples.

Find out whether the subjects taught in primary school are put in order in accordance with Piaget's theory of cognitive development.

What subject matter can be comprehended using a higher level of abstraction?

Write down the types of reinforcement we most often encounter in school.

Measure your short-term-memory capacity.

Create your own forgetting curve.

Find examples of optical illusions and apply Gestalt laws to them.



● Review Questions

What is the difference between learning defined more narrowly and more broadly?

What laws of association do you know?

How did Hermann Ebbinghaus enrich the field of psychology?

What is the difference between classical and instrumental conditioning?

What has a greater effect on reinforcement – reward or punishment?

What is a Skinner box and what purpose did it serve?

Name the representatives of behaviourism and their main ideas.

What Gestalt laws do you know?

Have you ever experienced the aha! effect? Describe it.

What are the stages of cognitive development according to Piaget?

What is the process of learning according to Piaget?

● Summary

Learning is the process of acquiring experience that forms the individual over the course of his/her life. Theories of learning can be divided into endogenous and exogenous.

The associationists understood learning as the reinforcement of associations and their retention in memory and emphasised the receptive aspect of learning and repetition/memorisation. H. Ebbinghaus (1885) was a significant representative of associationism. His experiments resulted in the forgetting curve and in determining the capacity of short-term memory, which contains five to nine elements.

The theory of learning by conditioning is based on the work of I. P. Pavlov. The conditioned reflex method of learning contains the terms extinction, the process of generalisation, and differentiation. This kind of learning is based on a



random (trial) search for the correct solution. The basis of this learning is an instrument to obtain a positive effect which is represented by a newly acquired response. We learn such behaviour that results in our achieving the desired objective. Classical conditioning was further developed by the behaviourists (J. B. Watson, B. F. Skinner, E. L. Thorndike). The driving force behind learning is reinforcement. Positive reinforcement is provided through reward, while negative reinforcement occurs after a disruptive stimulus is removed from the organism. If an operant is reinforced, the probability of its repetition increases. This is the theory of operant conditioning. The behaviourists represent an experimental school; they focused on stimulus-and-response and ignored the investigation of experience and subjective findings.

Gestalt psychology claims that cognition and learning are done through perception, immediate insight and understanding how to solve a new problem (AHA – learning by insight). During this the perception field is re-structured (something changes in the structure which results in finding a solution). Gestalt psychologists emphasised learning with understanding; we should learn everything in structures and within a certain context and new subject matter should be fitted into existing structures. People prefer 'good Gestalts': harmonic, concordant, symmetrical and well-arranged as opposed to 'un-good' and badly arranged.

J. Piaget represents the cognitive concept of learning. Development involves the co-operation of learning and the organism's maturation. Learning occurs with the help of assimilation and accommodation. Piaget focused on the development of human thinking. He divided it into four stages: sensorimotor, pre-operational, concrete operational, and formal operational.

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3 Learning Types and Conditions, Transfer of Learning

● Objectives

After studying this chapter the student will be able to orient him/herself in individual types of learning. Sensorimotor, rote, conceptual and social learning will be discussed in more detail. The student will study individual types of memory, types of inference and conceptual learning, and will gain basic knowledge of socialisation. He/she will be introduced to individual cognitive and learning styles. The student should be able to discern what types of learning he/she uses, to analyse his/her individual processes, and to think about his/her own individual style of learning.

● Time Demands

5 hours

● Terms to Remember (Key Words)

Types of learning; imprinting; learning by imitation; habituation; unintentional learning; learning by instruction; algorithmic learning; insight learning; sensorimotor learning; stereotypes; plateau; stages of memory; memory trace; forgetting; extinction; memorisation; mnemonic technique; drill; ultra-short-term memory; short-term memory; long-term memory; episodic memory; semantic memory; concept; inference; judgement; thought operation; generalisation; analysis; synthesis; convergent and divergent thinking; thought categories; problem solving; thought interiorization; socialisation; direct reinforcement; imitation; identification; internalisation; model; A. Bandura; vicarious reinforcement; paradoxical reinforcement; norms; cognitive style; holistic style; sequential style; tendency towards verbalisation; tendency



towards visualisation; learning style; four categories of learning preferences by Dunn and Dunn; Entwistle's modes of orientation for the learner; Kolb's model; instruction style; learning conditions; learning transfer (facilitation, interference); stages of the learning process; the stage of learning and the learner; the stage of learning from the teacher's viewpoint.

3.1 Types of Learning

Gagné (1975) distinguishes eight types of learning: signal learning; stimulus-response learning; chaining; verbal association; discrimination learning; concept learning; rule learning; and problem solving.

Referring to Mayer and Kulič, Mareš (1998, pp. 69–70) mentions various types of learning according to a host of different criteria.

a) According to processes and agents:

- a. sensory learning (sensation), perception learning (perception),
- b. sensorimotor learning (motor skills),
- c. verbally conceptual learning (thinking, language),
- d. emotionally motivational learning (experience, interests and needs, motivation models),
- e. social learning (attitudes, roles, relationships),
- f. learning leading to a change in personality (properties, values, self-concept).

b) According to external form and applied approach:

- a. learning by imprinting – learning associated with the sensitive period in a person's life (early childhood);
- b. learning by imitation – learning based on observing the behaviour of other people and its intentional or unintentional imitation;



- c. learning by habituation – an individual gradually starts ignoring a certain stimulus, because he/she will start considering it known and thus non-threatening;
- d. learning by classical conditioning – by repeated connections with an originally neutral stimulus (bell, light), an originally unconditioned response of an organism will change into a conditioned stimulus that will cause an original, unconditioned response (I. P. Pavlov);
- e. learning by operant (instrumental) conditioning – learning of the stimulus-response-reinforcement type (positive, negative) (B. F. Skinner);
- f. trial-and-error learning – unsystematic learning by experience that leads to the choosing of better solutions (E. L. Thorndike);
- g. latent learning – unintentional learning during which an individual naturally adopts certain stimuli and types of behaviour from his/her environment;
- h. learning by instruction – a type of verbal learning based on the opinions and ideas of an authority;
- i. algorithmic learning – based on precisely set processes, rules or guidelines;
- j. learning according to heuristic learning strategies – a type of learning that is not associated with precise rules and determined processes and that provides space for seeking and finding creative solutions;
- k. learning through insight – a type of learning based on a sudden, one-off understanding of context and relationships.

c) According to the extent of deliberate intention:

- a. intentional learning,
- b. unintentional learning.

d) According to who or what is learning:

- a. learning of subhuman animals,
- b. learning of humans,



c. learning of programmes and technical systems.

e) According to the contribution of the subject of learning to this activity:

- a. learning by spontaneous self-regulation,
- b. learning with external management,
- c. learning in an interactive dialogue,
- d. learning with deliberate self-regulation.

From the developmental viewpoint we distinguish:

Simple forms of learning: a) classical and operant conditioning
 b) learning through insight

Specifically human forms of learning:

- a) sensorimotor learning
- b) verbal learning
- c) cognitive learning (conceptual,
 problem solving, principle)
- d) social learning

Special forms of learning: a) imprinting
 b) habituation

The developmentally highest forms of learning by problem solving and learning by principles and concepts fluently follow the developmentally lower forms.

One can learn unintentionally (indirectly) or intentionally (directly), randomly or systematically, subconsciously (by suggestion, sympathy or imitation) or with the full participation of the consciousness, in a group or individually. Therefore, we can distinguish many other types of learning according to diverse criteria.



We will now pay more attention to the following four types of learning: **sensorimotor learning** (acquisition of motor skills); **rote learning**; **conceptual learning** (the creation, acquisition and structuring of concepts through thought operations, especially through generalisation and abstraction, including logical operations), which also includes learning by problem solving (the independent detection of solution principles and their transfer to analogous situations); and **social learning**.

3.1.1 Sensorimotor Learning

Mareš (2013, p. 87) understands sensorimotor learning to be 'the acquisition of motor skills, entire motor structures, which depends on the peculiarities of an individual's personality, his/her motor pre-requisites, performance factors, and the method of acquisition'.

As products of sensorimotor learning, motor skills include 'scholastic' skills, e.g. reading, writing, drawing and playing a musical instrument, but also athletic skills and a whole range of complicated and less complicated work skills (fine motor skills, e.g. those of a watchmaker or goldsmith, and gross motor skills, e.g. those of a fire-fighter or miner). They also include driving a car.

As the name suggests, the basis of sensorimotor learning is the connection of the processes of cognition and movement. It is about the simple as well as the very complicated connections between sensory and motor skills, about the connections between movement activities (soft and gross motor skills) and the senses, and about the co-ordination of percepts and movement. Its products include motor habits and sensorimotor skills, often in the form of dynamic stereotypes (see further in the text).

This type of learning is ongoing, beginning in early childhood and without the support of any verbal component (walking, grasping objects). It is based on



practice and training and is accompanied by and corrected using verbal instruction; it runs according to a certain plan, and feedback is important.

The outcome of sensorimotor learning – apart from individually acquired skills – is a stereotype (dynamic stereotype). According to the Pedagogical Dictionary (*Pedagogický slovník*), this is 'an automatic fixed sequence of activities which does not require detailed thinking from the person executing it, the execution of an activity in the same manner, quickly, precisely, economically and often unconsciously' (Průcha, Walterová and Mareš, 2003, p. 230).

In other words, it is about the ability of a person to connect individual motor tasks into meaningful units of a higher order up to the level of automatic activity. It is pleasant for us to act in accordance with a dynamic stereotype.

Example: driving a car – I need to learn individual steps to start driving – I learn them separately and I do not have a problem with them, but I am not driving. I will start driving when I connect them and gradually make them automatic.

One can discern movements with a prevalence of *reactive components* and with a prevalence of *operative components*.

Types:

*a) A pupil learns movements with a prevalence of **reactive components**:*

Simple movements that can be divided into individual stages. It is possible to provide a stimulus to execute a stage (write down letters, play a note, etc.).

*b) A pupil learns movements with a prevalence of **operative components**:*

A dynamic stereotype originates by putting individual segments in order and connecting them. We then speak about *skills, habits and bad habits*. Each of us



has a whole range of dynamic stereotypes. It enables us to focus our attention on another activity (when playing basketball, if I know how to dribble, I do not have to look at the ball and can follow the movement of my teammates and opponents, etc.).

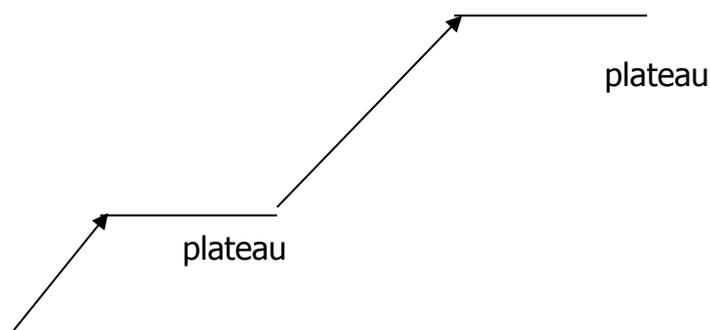
Stages of sensorimotor learning:

- 1) stage of instruction, demonstration (a task is demonstrated or explained, a manual is read, etc.)
- 2) stage of first attempts (trial: a learner usually tries clumsily to execute the activity in question, with his/her skills gradually improving up to the level of a certain degree of acquisition). External control by a teacher or coach is important.
- 3) stage of practice, perfection (skills have been acquired and repeatedly practiced – trained – up to the level of them becoming automatic). Internal control (correction) can be applied here, i.e. an individual can independently correct the sequence of acquired skills.
- 4) final stage – an exit evaluation verifying the level of mastery of a certain skill. This stage appears only under specific conditions (during sports competitions, a practical final exam, a driving exam to get a driving licence, etc.).

Individuals are variously disposed to acquiring sensorimotor skills. If this acquisition is relatively easy and occurs in a quality manner and quickly, we are dealing with an above-average level of sensorimotor intelligence in gross motor skills (colloquially called skilfulness) and in fine motor skills (dexterity). See Gardner's theory of multiple intelligences.

Learning plateau. Our performance increases with practice until we reach a level when our performance stops improving and stagnation occurs (or even regression, decline). This is called a 'learning plateau', i.e. despite every effort, the level of performance cannot be improved under the given conditions.





Under certain circumstances, the plateau can be overcome, if there is a change to a) the learning conditions, b) the method of learning, and c) the motivation of the learner. However, even after such changes, the individual – even though at a higher level – will eventually arrive at another plateau which may be overcome only with great difficulty or not at all.

The result of sensorimotor learning is (or should be) the execution of a given activity in a quality manner so that:

1. movements become precise and efficient,
2. their fluency and aesthetic aspect increase,
3. they become rhythmical and automatic,
4. internal control becomes activated (an individual is able to judge him/herself whether the activity is being executed in a quality manner).

3.1.2 Rote Learning

As the starting point for the discussion on rote learning, we can use the previous explanation of the memory experiments conducted by H. Ebbinghaus. As mentioned earlier in the text, he investigated the relationship between the volume of the subject matter and the number of repetitions required for its acquisition using nonsense syllables. This method of acquiring knowledge was based on mechanical learning during which an understanding of the content



does not have to be present at all or only fractionally (Hartl and Hartlová, 2010, p. 641). In the Pedagogical Dictionary (*Pedagogický slovník*), this idea is elaborated on: this type of learning occurs 'without logical organisation, without searching for the essential components of the subject matter, without an effort to comprehend the subject matter' (Průcha, Walterová and Mareš, 2003, p. 119). The same authors point out the fact that this mechanical memorisation ('thoughtless' learning) occurs in a stable order with relations among the subject matter's individual elements created only through repetition: A-B-C-D-E-F-G, etc. With this method of learning there is a danger that, for instance, if one does not recall the element C from one's memory, the learned sequence is interrupted and one loses the chance to recall the subsequent components in the chain. This is a type of learning without comprehension of the subject matter and thus without the possibility of deriving the forgotten through thought operations.

It appears from the aforementioned that this type of learning is ineffective and has its limits, especially when we need to learn larger units of subject matter which cannot be mechanically 'grasped'. A pupil who manages to learn mechanically lesson by lesson must fail when applying this approach to a general half-year revision or when trying to revise for his/her secondary-school leaving exam.

When we speak about rote learning, we mean mechanical learning, being aware of the fact that in real situations a clear differentiation between mechanical learning and conceptual learning (thought learning, learning with comprehension) is often not possible. Therefore, it is not right to completely reject this type of learning, as there is some content that can hardly be learned in another way than by repetition. As examples we can state enumerated words containing an ambiguous consonant, foreign-language vocabulary, non-deducible symbols, etc. Within this context, Mareš (2013, p. 95) claims that rote



learning is a 'necessary pre-requisite for learning through discovery and problem solving'.

To master such subject matter better, one is helped by mnemonic devices that help 'record the memorised material into a new form that is more easily memorised by the pupil' (Průcha, Walterová and Mareš, 2003, p. 126). A known example of this is the rhyme that helps one remember the order of guitar strings, etc.

Unfortunately, there are also less desirable reasons for preferring mechanical memorisation. In terms of the pupil, these can include comfort (he/she does not want to think and takes advantage of his/her good memory) or the fact that he/she does not understand the subject matter so he/she learns it by heart. In terms of the teacher, there may be satisfaction that the pupils can rattle off definitions or components of subject matter without understanding them (exactly as they have it in their exercise books, textbooks, etc.).

Memory stages:

Traditionally, three stages with somewhat non-unified names are distinguished, so we therefore provide more possibilities (in parentheses):

- I. Encoding (saving to memory, remembering, instilling)
- II. Storage (remembering)
- III. Retrieval (reproduction, recognition, recall)

According to Atkinson (1995, p. 301), the aforementioned can be expressed with three commands: *Save to memory! Store in memory! Retrieve from memory!*

Human memory can be defined as a set of mental processes and properties enabling one to acquire experience and to remember, to retain and to recall it. It is one of the most important properties of living organisms. Memory is



developed and perfected by learning similarly to other mental properties and processes.

Memory: the reflection of past experience and behaviour in a person's consciousness. When we perceive something, a certain *trace* remains in the neurons of the highest part of the central nervous system and this enables one to retain and to recall experiences.

The process of *forgetting* is a general term for the changes in retention and recall which occur over time. It is manifested by the quantitative loss of retained knowledge as well as by its qualitative changes.

Forgetting is ascribed to the extinction and deformation of memory traces in the central nervous system. It is influenced by a host of factors:

- a) content of the subject matter (we remember things we understand better),
- b) range of the subject matter,
- c) importance of the subject matter to the learner,
- d) motivation of the learner (interest/disinterest in the subject matter),
- e) methods and techniques of teaching and learning,
- f) 'trained' memory,
- g) time interval (see Ebbinghaus's forgetting curve),
- h) suitable/unsuitable learning conditions,
- i) presence/absence of emotions,
- j) a special role in the prevention of forgetting is played by the frequency and quality of repetition.

Effective repetition is characterised by regularity and requires an active approach from the learner. For example, instead of thoughtless repetition, we try to independently reproduce the subject matter. Other methods of active – and thus effective – repetition include the preparation of teaching aids,



discussion of the topic up to the level of understanding, mutual examination, solution of tasks with various possibilities including practical tasks, writing notes, etc.

In order to remember important segments of the subject matter better, it is suitable to position these parts *time-wise* when teaching (teacher) and learning (learner) at the beginning and at the end of the period of teaching/learning, not in the middle.

For instance, when learning 20 nonsense syllables (or 20 words) in a row, those in the position of being hardest to remember according to the serial position effect are those that are in the middle (in our case positions 12 to 15). In a modified form, the laws of association have an impact here as well (similarity, contrast, figure and background, etc.).

Memorisation → *learning by heart, intentional* → remembering → *mnemonic technique*

Mnemonic technique – a set of aids that help one to remember. Learning includes remembering, especially intentional remembering.

Mnemonic devices – we strengthen connections that do not have a link (or do not have a link for us) – we add some context, our own meaning, e.g. look for associations.

Mechanical repetition – drill.

Types of memory

In terms of time, we traditionally distinguish short-term memory (seconds, minutes), medium-term memory (hours, days), and long-term memory (weeks, months, years). The terminology is yet to be unified in this matter.

For example, Mareš (2013, p. 97) distinguishes:



1) Immediate or sensory memory (ultra-short-term memory). This type of memory is considered the 'entrance gate' for the two other types of memory. People are bombarded by a whole range of stimuli both externally and internally. Only some stimuli and subsequent percepts are important for a person. Therefore, the retention of percepts that are not important for a person must be very short (Mareš says milliseconds) to have space for other percepts. This sensory memory is associated with the function of our individual senses. We can distinguish between visual, acoustic, olfactory, gustatory, tactile and motor memory. In addition, we remember and can distinguish between types of pain coming from our bodily organs.

2) Short-term (working) memory enables one to retain information within seconds (15–30 seconds). Mareš provides the known example of remembering a telephone number until we use it to make a call. Then (after use), unless we write it down or save it in our long-term memory, we usually forget it. The capacity of short-term memory has its limits (see Atkinson's thoughts on the magical number 7 ± 2 elements, words, syllables or numbers we are able to remember at once and reproduce after one presentation).

3) Long-term memory is considered the most complicated by Mareš (2013, p. 97): 'Its function is to organise information into complicated networks, to connect new knowledge with 'old' knowledge, and to keep information available for months, years or decades.' He distinguishes two basic types of long-term memory:

- a) *episodic memory*, which stores information about episodes, usually experienced events that have the character of reminiscence;
- b) *semantic memory*, which enables us to organise, classify and put our knowledge into a context.

Other possible and classifiable types of memory: unintentional vs. intentional memory, mechanical vs. verbally logical memory.



3.1.3 Conceptual Learning

The term 'conceptual learning' underscores the fact that the focus of this type of learning is on the application of thought processes; it is primarily – as opposed to rote learning – a type of learning that involves understanding (comprehending) the essence of the subject matter to be acquired. We must also emphasise that a clear distinction between rote learning and conceptual learning is more of a hypothetical and didactical construct that enables us to better understand the essence of both types.

Thinking is the highest form of cognition, and in connection with speech it occurs only in humans. It is based on the reinforcement of relationships between objects and phenomena (Hyhlík and Nakonečný, 1973); it enables one to acquire an intermediated and generalised cognition of reality, to discover the essence, and to 'go' beyond the perceptible and the present. Through thinking, one can comprehend and look for solutions to problems and understand causal and functional relationships. Speech is an essential condition for the development of human thinking and concepts are its foundation.

The products of human thinking are concepts, inferences and judgements. A concept is usually a verbal expression of the essential and general properties of objects and phenomena. We can distinguish between the content (the definition of a concept through its essential attributes) and the extent (the degree of generality; from unique concepts to concepts with a high degree of generality) of the concept. We can also distinguish between concrete concepts (excavator, table), abstract concepts (peace, love), and empty concepts (a speaker uses words whose content is not known to him/her, a kind of skin without content).

An inference expresses a relationship between two or more concepts in the form of a claim (+) or a denial (-).



Inference as a claim = Snow is white; inference as a denial = Snow is not white.

Analytical inference: explains the content of the concept = A mother is any woman who has a child.

A priori inference: accepted without one's own verification = the mountain Sněžka is 1602 m high.

A posteriori inference: expression of one's own experience = This summer has been rainy.

Apodictic inference: valid always and everywhere = $1 + 1 = 2$ (see Hartl and Hartlová, 2010, p. 541).

Judgement (or conclusion) enables us to express a relationship between two or more inferences (premises). There are three basic types of judgements: inductive judgement (from details to generality), deductive judgement (we deduce details from generality), and analogical judgement (similar or identical properties or experience establish an assumption that subsequent similar situations, objects and persons will have similar or identical properties).

Thinking is realised through *thought operations*. Thought operations are externally and directly undetectable mental processes through which information from an individual's external and internal environment is processed into knowledge, skills, adoption of opinions and attitudes, understanding, and finding solutions to problem situations, etc.

We distinguish: *classification and categorisation* – according to conspicuous attributes in childhood and later according to more sophisticated criteria; *analysis* – thought division of a whole into parts (e.g. a child takes a toy apart); *synthesis* – thought connection of parts; *comparison* – we compare similarities and dissimilarities, differences between phenomena and objects (e.g. a child compares which of two cubes is bigger); *abstraction* – we usually intentionally set aside or omit non-essential properties of objects and phenomena and



concentrate on their essential attributes; and *generalisation* – creation of classes (categories, groups) of objects and phenomena on the basis of common attributes (properties).

Stages of conceptual learning, of creating concepts:

- 1) In the first stage, we encounter *initial* generalisation. The process of analysis is absent. Pupils judge phenomena on the basis of their external (conspicuous) attributes; the details escape them. Colour, shape, movement and unusualness are dominant. These conspicuous attributes are not necessarily essential for the group of objects and phenomena in question; on the contrary, they can be secondary.
- 2) The *process of analysis* dominates the second stage. A child begins to notice details, specifics. He/she 'can't see the forest for the trees', sticks to the details and the wider context escapes him/her.
- 3) In the third stage, the process of *analysis and synthesis* is proportionate – they mutually balance each other, complement each other. Neither one of them plays a more dominant role. Example: when a pupil learns to count to five, he/she must know that the number five is not only the last number in a sequence of numbers (analysis), but that this number also expresses previous numbers (synthesis).

Distinguishing types of thinking according to a certain generally accepted criterion is not easy. In the Large Dictionary of Psychology (*Velký psychologický slovník*) we find a respectable number of entries devoted to various types of thinking that is close to one hundred (from abstract thinking to slow thinking – see Hartl and Hartlová, 2010, pp. 324–327). The same authors divide thinking into '1) *conscious thinking, controlled by a person and occurring in ideas, images, symbols and signs, i.e. words, and 2) unconscious thinking, uncontrolled by the consciousness*' (2010, p. 324). From the aforementioned they further derive: a) intentional and focused-controlled thinking (I am aware of the fact I am thinking, solving a problem, making combinations, etc.); b)



non-volitional thinking; and even c) thinking occurring against the will of the individual (obtrusive thinking).

From another point of view, thinking can be divided into practical (based on an individual's experience), concretely demonstrative (which prevails until the child turns 10 or 11), and abstract (based on the ability to work with abstract concepts and ideas) (compare with Piaget's stages of cognitive development).

The division of thinking into *convergent* and *divergent* is also popular in psychology. The former seeks one correct solution. All other solutions or other results are incorrect. Contrary to that, divergent thinking involves there being more possibilities for a correct solution and thus encourages an individual's creativity. In this regard, instruction in our schools is repeatedly criticised, as it unilaterally prefers convergent thinking (looking for and discovering only one correct solution and what is worse, only one correct procedure to apply when looking for the correct solution) to divergent thinking, which is closer to practical needs and normal life situations.

The quality of our thought processes (thinking) derives from the 'internal' – primarily intellectual – potential of the individual in combination with the possibilities for development intermediated to the child/pupil by his/her social environment. Quality thinking is characterised by its depth of problem solving, its effort to understand the essence of what is being discovered (the contrary is shallowness of thinking), its openness and flexibility with regard to processing and receiving new knowledge, its aptness, its systematic manner and consistency in the realisation of thought processes, and its healthy level of criticality towards the opinions and attitudes held by oneself and submitted by other people (e.g. through the media, etc.).

One of the basic mistakes in human thinking is the creation of categories (classes, groups) of objects and phenomena on the basis of superficial



(conspicuous and thus usually non-essential) attributes (children often create categories according to colours and shapes and not according to the function a group of objects has in common). A similarly frequent mistake is the generalisation of a single (unique) experience into a whole class of phenomena (one bad experience with a person of a certain ethnicity is then ascribed to the entire ethnic group).

Speech (concepts, words, thoughts) is a tool of human thinking. We usually distinguish so-called internal speech (speaking to oneself), through which we think, organise and formulate our own thoughts, and external speech, through which we express our thoughts (knowledge, opinions, attitudes, etc.) to the outside. This external speech is a tool for communicating with the environment. It has a written and oral form. Speech has a content aspect (what we say) and a formal aspect (how we say it). It is important for the credibility of our communication that the form and the content are in accordance with each other.

Apart from communicating through speech (words, i.e. verbal communication), non-verbal communication, including facial expressions, gestures, posture, touching, movement and the distance between communicators, is also a very important component of interpersonal interaction.

Learning by problem solving is a type of conceptual learning and is often singled out as a special form (see Čáp, 1980). The starting point is the statement that learning to solve problems is a more difficult and specific thought process. Therefore, the skills and abilities to solve problems (tasks, assignments) should be continuously developed, especially in a school environment.

The term 'problem' comes from Greek and represents a task that should be solved or a disputable, as yet undecided question or a question that is yet to be



solved (compare Rejman et al., 1971, p. 301). For our purposes, the definition claiming that a problem is 'a goal for whose achievement paths are being looked for as opposed to a task for whose achievement the paths are already known' is closer to us (Hartl and Hartlová, 2010, p. 443). Thus it seems that in the case of instruction, a pupil is confronted with a type of task (assignment) for which he/she has no ready solution (e.g. the mere substitution of quantities in a formula). In this sense, he/she encounters a 'new' task and has to find or discover a 'new' (original) solution using his/her own active thought processes.

Problems are either brought by life itself via a situation we cannot solve in our usual manner or are submitted to us intentionally with the aim of teaching us to solve problem situations (tasks, projects). A well-chosen problem contains a motivational element. It is a challenge for the solver and causes a desire to find the correct solution. In this context, Kolář et al. speak about a didactic problem as '*a practical or theoretical difficulty which the pupil solves alone, or together with others, using his/her own active investigation*' (Kolář et al., 2012, p. 107).

In the process of instruction, one can distinguish three basic levels of problems. At the first, easiest level, the problem is formulated by the *teacher*. He/she determines what the pupils should solve. At the second, higher level, a pupil is asked to *formulate and subsequently solve* a certain task. The pupil orients him/herself in a certain topic and formulates the problem on his/her own. The third level is the most difficult as within the topic the pupil *has to find the problem, formulate it, and then decide on a certain method for its solution*.

From a didactically practical perspective, the solution of problems can be implemented in several ways: the problem is solved by the class together under the leadership of the teacher; the problem is solved by a group of pupils (this can be work done in class or a project to be solved over a longer period of time); or problems are assigned to each pupil to be solved individually.



When solving a problem situation, one can detect and describe the following stages:

1. *Encountering a problem* – in the form of an assignment a certain person *must* fulfil (typical for school problems) or an individual actively solves a certain problem (at work, in life situations),
2. *Orienting oneself in the problem situation and naming the problem,*
3. *Preparing a solution to the problem, or formulating pre-requisites (hypotheses),*
4. *Solving the actual problem,*
5. *Verifying the correctness of or perfecting the solution and applying it.*

The aforementioned stages could be adapted with regard to the sophistication/simplicity of the problem situation, the degree of motivation and experience of the solver, his/her ability to apply methods to help him/her find an optimal solution, etc.

Essentially, one can solve problems in two ways. The first possibility is rational ('scientific') and uses thought operations to factually analyse everything that helps one's orientation in the problem, followed by a formulation of the process of investigation, its implementation, and feedback that enables one to judge the correctness of the chosen solution (see stages of solving a problem situation above). The second possibility is an intuitive approach that uses the experience of the person who is solving the problem situation. Intuition can rely, for instance, on insight into the situation based on analogy or social intelligence, but also on a trial-and-error solution. Intuitive solutions can be risky with a higher probability of failure, but under certain circumstances they can be time-saving and more effective. In manuals for managers, one can read that rational solutions should be and are applied in practice at work (in the professional sphere) and that intuitive solutions are more frequently applied in the private sphere.



In connection with his/her age, a child goes through stages when solving problems, ranging from external motor activities with objects through speaking aloud to internal speech and internal shortened thought processes. This is called thought interiorization (thought internalisation), which begins with material learning, materialised activity. By materialised activity, we mean the manipulation of objects. It is based on manipulation resulting from a current activity, for the time being without the presence of concepts. From these external motor activities one moves to solutions at the level of loud, external speech (synchronising speech and the manipulation of objects). The child verbally accompanies the tasks he/she is doing. A solution is sought and found through trial and error and through sudden comprehension, i.e. insight.

A solution in the form of internal speech is detailed in the beginning, executed similarly to the abovementioned loud, external speech, but a *shortened* process occurs subsequently. Gradually one also moves from the detailed control of all elements to some parts of the process happening automatically. This means that the solution precedes the manipulation and is realised in advance 'in the head'. A pre-requisite for successful problem-solving and the good development of intellectual operations is to respect the aforementioned stages.

3.1.4 Social Learning

Social learning is a topic which belongs to social psychology. However, it is included in educational psychology for two basic reasons. 1) The process of socialisation is becoming ever more education-related, i.e. to a larger extent there are targeted interventions into the process of 'an individual's growth into the society'. 2) Social learning is greatly influenced by educational interventions, and therefore one has to pay attention to it.



E. Sollárová states that a human being comes into the world only as a potential person. He/she only becomes a real person through the process of socialisation (cited in Výrost and Slaměník, 2008). Social learning is learning within the framework of interaction in the society and this interaction enables one to socialise.

In the Large Dictionary of Psychology (*Velký psychologický slovník*), socialisation is defined as:

the integration of an individual into the society through imitation and identification; at first in the immediate family, then in small social groups such as a school class, a hobby club or a sports team, and finally joining the broadest society-wide relationships. (Hartl and Hartlová, 2010, p. 537)

Socialisation is therefore a process of making an individual's personality sociable and of his/her growth, inclusion in and integration into the society in which he/she lives. It is the acquisition of social experience and norms. It is a life-long process, with the largest advances and changes in this process of becoming sociable occurring in childhood and adolescence.

In other words, socialisation can also be defined as a process during which a biological being becomes a social being (compare with Hyhlík and Nakonečný, 1975). An individual grows into the society and acquires its behavioural patterns. If a person lives outside human society, he/she cannot develop as a human being.

Various social groups which affect an individual, and respective persons with whom he/she enters into diverse relationships, can be considered socialisation agents. However, the main agents – agents with the highest socialisation influence – include such groups in which an individual is included from an early age, relatively permanently, for a long time and stably (Sollárová, cited in Výrost and Slaměník, 2008, p. 50). Logically, the most influential groups are



thus one's family, school (school class) and peer group. In adulthood, these include groups at work (work teams). In recent decades, more significantly than ever, modern means of communication (TV, Internet) assert themselves in a 'socialising manner'.

All social relationships are learned. Thus we come to the term 'social learning'. When comparing the definitions of socialisation and social learning, the similarity or even identity of both processes is obvious. Social learning can be understood as the intentional or unintentional creation and acquisition of skills, knowledge and habits of a person in the society (compare with Lašek, 2002).

The most frequently mentioned concepts of social learning include direct reinforcement, imitation, identification and internalisation. In the case of imitation, identification and internalisation, Lašek mentions three stages of the socialisation process that occur repeatedly when a person enters a new social situation (a new class, a new team, a new social group, a new job, a new family, etc.).

At a later age, the stage of imitation and identification is shorter and internalisation occurs more quickly and more deeply. (Lašek, 2007, p. 67)

An adult individual in a new situation usually unconsciously looks for a model (e.g. an experienced colleague) that he/she identifies as such, and moves through all three stages in a shortened version.

In the case of direct reinforcement, social reinforcement plays an important role. It takes the form of social reward (praise, recognition, a good mark at school, etc.) or social punishment (rejection, reprimand, corporal or other punishment). Theoretically it applies that rewarded behaviour becomes fixed (reinforced) and socially punished behaviour is lessened, eliminated or changed.



Apart from direct reinforcement, A. Bandura distinguishes vicarious reinforcement in situations where the observer imitating the model's behaviour anticipates a reward for certain behaviours. From these types of external reinforcement he distinguishes self-reinforcement, 'which applies to a situation in which an individual's behaviour is motivated by an effort to achieve his/her own idea or norm and does not depend on the reaction of others' (see Sollárová, cited in Výrost and Slaměník, 2008, p. 57).

In social contact, paradoxical reinforcement can occur under conditions where the person providing this reinforcement 'paradoxically' fixes a certain type of undesired behaviour in a child through excessive rejection.

Imitation deservedly belongs among the basic forms of social learning. Starting in childhood, the child unintentionally imitates those persons closest to him/her, i.e. those with whom he/she has an emotional relationship and is in frequent contact – naturally his/her parents at first. These persons become a model for the child, *stimulating in him/her a tendency towards similar behaviour*, appearance, etc. with their appearance, behaviour, way of thinking, attitudes, expressions, opinions, performances, etc.

Unintentional imitation is gradually complemented by (expanded with) intentional imitation. This expands the range of possible models to be imitated. A model can be: a) a real, currently physically present person – mother, father, sibling; b) persons with a higher social status (a teacher, an older buddy) – these persons are either intentionally picked (education) or picked by the imitator him/herself; c) a mediated model (the mass media); and d) real historic figures, figures from myths and legends, literature and film heroes, etc.

It generally applies that individuals choose persons who impress them for some reason as their models. For instance, they are superior to them in terms of age, skills, material (economic) status, or social or intellectual abilities. It is therefore



natural that famous, intelligent, rich, clever or older people are preferred as behavioural models.

The terms 'imitation' and 'identification' are often substituted for each other and not distinguished. From our point of view, we consider it purposeful to distinguish identification from imitation, especially in its unintentional form. To identify oneself with a model (idol), especially in puberty, means a very strong connection between the individual and the model, even up to the level of experiencing a 'dual life', one common and real and the other fictitious, in which the imitator identifies him/herself with his/her model (idol). This model (idol) is admired and adored, many times up to the level of amorousness and fanaticism. His/her successes are experienced with the same enthusiasm as one's own and his/her failures, problems, etc. can cause infinite sadness. Identification is about 'depth'. I know everything about my idol. It is obvious that this identification can relate not only to individuals (actors, singers, athletes), but also to groups (music bands, sports clubs, but also certain sub-cultures, extremist groups, etc.). During the period of adolescence, it is very important that the persons (groups) with whom a young person identifies him/herself are 'of quality', which, unfortunately does not include our current 'tabloid-created celebrities'. This intense identification period should gradually be abandoned as the personality matures; real life and real relationships should be given preference.

In the case of internalisation, complete identification with the original model occurs. His/her behaviour, opinions and attitudes become an integral part of the imitating individual's personality. They are internalised up to the level of it becoming difficult to distinguish whether the imitator's personality is manifested in the behaviour or whether and to what extent it is imitation (Lašek, 2002).

Each community of people, in order to exist functionally, needs to have rules (social norms) that regulate the relationships in a given society. These norms



are acquired by everyone through social learning. Social norms have an oral (custom) or a written (codified) form. Codified norms are decrees, regulations and laws. Any non-adherence to or breaching of social norms is variously sanctioned (punished, penalised). The degree of punishment depends on the dangerousness of the breach of a given norm for the society (a different punishment will follow the theft of a roll in a store than that for an armed robbery).

Earlier in the text we said that the existence of social norms (rules of co-existence) is necessary. Societal norms can be of various origins. They can originate spontaneously or elaborately, by being taken over from another community or by their modification; they can be created by general agreement (i.e. through a democratic procedure) or by the dictate of an individual or a group with the possibility of enforcing 'their' norms through power.

Usually, conventional (unwritten, non-codified) norms in the form of habits and customs are distinguished. Non-adherence to them or breaching them brings societal condemnation of the individual. Conduct is considered to be polite/impolite, well-mannered/ill-mannered (e.g. in the case of an individual who 'cannot' greet someone, express his/her thanks, or request something politely). A more negative societal response is given to those who lie, cheat, go back on their word, etc. Their behaviour is considered immoral (i.e. in contradiction to good behaviour).

Under certain circumstances, conventional norms can overlap with codified norms. For example, slander that will not cause obvious harm to the damaged person will be assessed as immoral. In the case of proven material damage or other damage as a consequence of the intentional dissemination of untrue information, the perpetrator can be sanctioned, as he/she has already breached a codified norm, in this case the law.



Codified norms are regulations, decrees and laws and their breach and non-adherence is accompanied by sanctions. For this purpose, the society establishes persons and institutions that supervise the proper fulfilment of codified norms and subsequently punish those who breach them (clerks, police officers, public prosecutors, judges and incarcerators). Taboos represent a specific and traditionally codified norm. Taboo is an unofficial term for a norm whose breach is not only against the law, but also causes aversion of and disgust towards individuals who commit especially serious crimes (e.g. the sexual abuse and subsequent murder of an infant, sadistic serial killers, etc.). In such cases, societal demand for the strictest possible sanctions (e.g. calling for the restoration of capital punishment) increases.

The number and character of social norms is affected by how advanced the society is, i.e. by the ability to accept mutually agreed rules and laws as its own. At both the social and individual level, this acceptance of norms means that they are interiorised.

An interiorised norm becomes a belief, principle and moral tenet, and is applied when deciding about the manner of conduct and behaviour. (Výrost and Slaměník, 2008, p. 288)

The more internalised norms are represented in as high a number of the inhabitants of a given society as possible, the fewer external sanctioning codified norms (i.e. orders and prohibitions) are needed. Expressed through the words of R. Honzák:

The more implicitly given rules members of the society fulfil, the fewer explicitly declared regulations are needed. Laws including repressive measures will never achieve their effectiveness if they are not supported by the general or at least the majority ('customary') morality. (cited in Weiss et al., 2011, p. 55)

In this case, the implicit rule is understood to be the interiorised norm.



3.2 Learning Styles

Each of us is made up of unique individual characteristics. Some of them are more pronounced than others at certain times and determine an individual's pronounced attributes more strongly. With these characteristics we describe an individual's personality. In the pedagogical area we can speak about an individual's cognitive style and learning style.

Our cognitive style determines how we process information. This cognitive style is manifested in an individual's intellectual and perception activities and does not apply only to the pedagogical area. It affects the way in which we solve tasks. Every day we face a number of stimuli and situations that we have to process during which we distinguish what is essential for us, how we will react, and how we will assess the situation. The basic categorisation of cognitive styles is based on two mutually complementary scales. The first scale ranges from the holistic cognitive style to the sequential cognitive style. The second scale relates to the tendency to visualise on the one hand and the tendency to verbalise on the other (Mertin and Krejčová, 2012).

When processing information in a holistic style, it is important for us to get as much information about the topic as possible, to put the topic into a context, to understand the topic well, and to discuss it from more angles. On the other hand, in sequential processing a clear outline and structure of the topic are important for us. We write down and remember individual key words and remember the most important concepts in the form of comprehensive lists. If we tend to verbalise more, we will need to read enough text on the topic and listening to an oral presentation will suit us more. When describing the learned subject matter, we will use rather long sentences and will substantiate everything. On the other hand, if we tend to visualise more, we will help ourselves with a number of maps, drawings, pictures and other graphic representations.



In addition to cognitive styles, we also talk about learning styles that focus directly on the method of processing instructional materials. Try to recall your last preparation for an exam. How did you proceed in your studies? Did you prepare yourself systematically already during the semester and just revised essential concepts before the exam? Or did you leave everything until the end and then quickly try to go through at least the required literature? Did you revise the subject matter aloud or did you re-write the answers to the questions? What do your notes look like? Do you highlight in colour and write down the concepts in brief, or do you need to write the whole text down? This and many other factors contribute to your unique learning style. A learning style can thus be defined as the distinctive learning processes which an individual prefers in a given period of time. According to Mareš (1998), the styles are distinctive in view of their type of motivation (external, internal), structure (strategies, tactics), sequence (order of activities), depth (superficial vs. in-depth), elaborateness, and flexibility of application. Learning styles develop from cognitive styles, but change during one's life (both intentionally and unintentionally). An individual uses learning styles in the majority of pedagogical situations and they are relatively independent of the subject matter (Mareš, 1998).

The majority of us are not very aware of our learning processes and strategies and do not analyse them. We proceed automatically while learning, and thus our knowledge has a certain routine form. If we need to arrive at a different form, this could present a problem. The majority of pupils are forced to learn from the first grade. They are assigned what they are supposed to learn. They are then examined to see whether they know what they have learned. Unfortunately, many pupils are not told *how* they should learn, *how* they should proceed in the acquisition of knowledge. They figure it out themselves, through trial and error. Gradually, they develop a learning style. Many times, this style is not sufficiently effective. When transferring to an advanced level of education,



it may easily be the case that their existing style may not be sufficient for the requirements of the subject matter. At that moment, it is possible to diagnose learning styles and to change them gradually to a certain extent.

Apart from internal factors such as our personality characteristics and cognitive styles, individual learning styles are also influenced by external factors. Mareš (1998) mentions some of these. He includes the personality of the teacher – his/her learning and teaching style that he/she will most probably pass on the pupils and his/her concept of instruction. It is also important how the teacher examines and assesses a pupil's knowledge. Another factor is the subject matter itself – its optionality and relevancy and the operational structure of assignments. The overall concept of instruction is also of importance, whether it is a traditional or an alternative school. An important factor which affects the individual learning style is the pupil's learning conditions: whether the pupil has room, enough time and space for learning, whether he/she has suitable materials and aids. A pupil's social interactions are important: whether he/she has someone to help him/her with learning, whether he/she learns with someone or on his/her own, whether he/she has a model or an opponent who he/she wants to get ahead of in his/her studies, etc.

There are various concepts of learning styles, and we will only mention some of them. R. Dunn and K. Dunn (Dunn and Griggs, 1995) define a style of learning as a method through which individuals concentrate, process, interiorise and remember new and difficult educational information. According to these authors, a learning style is also influenced by the biological structure of the personality and has no evaluation aspect. Each style is good; only an instructive environment that does not correspond to a pupil's style of learning can be a problem. According to the authors, therefore, a learning style cannot be changed, but a learning environment can be adapted (Dunn and Griggs, 1995). The authors investigated individual learning preferences, which they categorised into four groups:



- (1) preferred physical environment (sound, light, temperature, furniture);
- (2) preferred emotional needs (motivation, perseverance, responsibility, structuring of assignments);
- (3) social needs (learning on one's own or with buddies, the need for an adult authority, changing of social conditions while learning);
- (4) preferred cognitive needs (preference for a certain way of receiving information – auditory, visual, tactile, kinaesthetic; preference for a certain time of day, consumption of beverages and food, movement while learning) (cited in Mareš and Skalská, 1994).

To measure individual preferences, the authors created an LSI (Learning Style Inventory), which Mareš adapted for our conditions (Mareš and Skalská, 1994).

Another model focused on the division of learning styles is N. Entwistle's theory. It concentrates on four student-orientation styles, namely comprehension, reproduction, success and holistic orientation. Combining these orientation styles, we get the following learning styles: deep, surface, strategic and apathetic. The deep learning style is characterised by the intention to comprehend, connection of thoughts, use of evidence and active learning, whereas the surface learning style is manifested by the intention to reproduce, unconnected memorisation, passive learning and fear of failure. The strategic learning style is based on the intention to excel and is manifested by organised studies, time management and following the requirements for evaluation. The apathetic learning style is characterised by a lack of management and interest (Cassidy, 2004; Rayner and Riding, 1997). This division takes into account the motivational aspect of learning styles. Its use is suitable and useful for secondary-school students and especially university students.

The last categorisation to be mentioned here is based on Kolb's experiential learning model. It is based on the assumption that if we are to learn something, we first have to do this activity (concrete experience), then self-critically assess our performance (reflective observation), learn from our mistakes and



understand the essence of the matter (abstract conceptualisation), and then apply this in our future activities (active experimentation). Learning occurs in a different manner in each stage, because a different activity dominates each stage of this cycle. The four stages of learning as four modes of cognition are reflected in the learning style (Petty, 2013). Each individual uses all modes of cognition when learning, but each of them in a different ratio. This creates a certain profile with variously represented modes of cognition, i.e. an individual learning style.

The fact that a certain learning style is dominant does not mean that we are incapable of acquiring knowledge through a different style. Applying our learning style will seem easier to us, but we are capable of learning using all of the possible styles. Furthermore, it applies that if we learn a certain subject matter gradually using various styles, we will understand it better. The individual styles complement each other (Petty, 2013).

Teachers should therefore use the multiple-presentation method in their explanations. The higher the number of various methods the teacher uses to present new subject matter, the better the pupils will understand it. At this point we will introduce one more concept – the teaching style. A teaching style involves the teacher's view of the subject matter, pupils, instruction methods, learning and teaching, communication with pupils, etc. and is reflected in his/her instruction (Řehulková, 2007).

Diagnosing learning styles can be done using direct and indirect methods. We can directly observe and subsequently analyse a student's learning process and related progress. It is also possible to use computer programs, with the student learning with the help of a computer while the process diagnostics of a student's learning style are executed (Kulič, 1992). If we wish to analyse a learning style indirectly, we can choose between qualitative and quantitative techniques. The qualitative ones include the analysis of a pupil's partial



products (projects, tests, portfolios) and the interview. The quantitative ones include questionnaires and assessment scales. One of the most ubiquitously used questionnaires in our country is the aforementioned LSI – Learning Styles Inventory. The use of diagnostic questionnaires can be of benefit to the pupils on its own, regardless of the results. Going through a number of questions focused on the issue of studying can prompt students to adopt a new view of the different possibilities with regard to learning styles.

3.3 Learning Conditions

Learning conditions can be understood as the way that a learner acquires experience both unintentionally and through an intentional activity (learning defined more narrowly).

One can distinguish the following:

(1) **Internal learning conditions** are related to the learner's personality. They include age, sex, biological and mental maturity, state of health, and previously acquired knowledge, skills and habits. A large role is played by the individual's motivation to learn, his/her general and specific abilities, the level of development of his/her cognitive processes, his/her style of learning, and his/her personality properties (volitional properties in particular). The emotional and social aspect of a learner's personality also plays a role.

(2) **External learning conditions** can be explained using the analogy of the circular ripples that appear on the surface of a pond after a stone is thrown in it. The 'circles' most distant from the centre – the learner (pupil) – consist of the broader material and social environment. Generally, these are climatic conditions. In addition, everyone is indirectly influenced by political, economic and cultural contexts and the material and technical advancement of a given society, all of which are reflected in the equipment of individual educational



facilities. Regional specifics (industry and its characteristics, school network and its accessibility, regional unemployment rate and education rate, regional educational policy and its priorities, demographic indicators, etc.) play a role as well. Now we have come to the educational facilities, which are defined by the preferred concept of instruction at a given school, the age and qualification structure of the teaching staff, the management style of the school's leadership, etc. In the classroom, pupils are directly affected, apart from the physical elements (temperature, light, noise, etc.), by social influences.

The relationships between teachers and pupils and among pupils – the inner circles in our analogy – are dominant. The family background of pupils (in particular the prevailing educational strategies of the children's parents) also has an indirect impact on the climate in the classroom and on the level of the implemented educational process.

The process of learning is specifically influenced by the teacher (age, sex, motivation, personality and professional maturity, specialised and pedagogical abilities, knowledge, didactical skills). Special attention must be paid to the subject matter to be acquired. This applies to the volume of the subject matter, its connectedness, its structuring, the proximity (or distance) of the subject matter from the pupil's daily experience, etc.

Internal and external conditions are specifically interwoven not only at school, but also in family upbringing and extra-curricular education.

3.4 Learning Transfer

The term 'transfer' in the context of the psychology of learning relates to the transfer of learning from one situation to another. Knowledge, skills, habits, opinions, attitudes and properties can be transferred.



We distinguish the following:

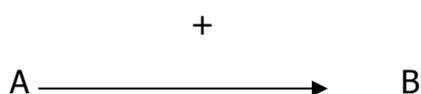
- a) Positive transfer (facilitation) occurs when previously acquired knowledge positively influences the acquisition of other subject matter (for instance, when learning a new foreign language we use the knowledge of another foreign language – both languages can have some similar vocabularies, etc.).
- b) Negative transfer (interference) occurs when previously acquired knowledge may make the acquisition of new subject matter more difficult (previously acquired vocabulary in a foreign language can be 'confused' with similar vocabulary; the movements learned for one sport can be a hindrance when trying to learn another sport, etc.).

Furthermore, we can distinguish transfer types according to the direction of influence:

- a) proactive transfer (previously acquired subject matter will influence what we learn later, influence from the past to the present – forward influence),
- b) retroactive transfer (newly acquired subject matter retroactively influences what we have already learned – backward influence).

By combining the quality (positive – facilitation, negative – interference) and the direction of the transfer (forward – proactive, backward – retroactive), we define four basic transfer types:

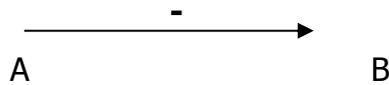
1) Proactive facilitation



- the positive influence of a previous activity on a subsequent activity
- subject matter A positively influences subject matter B
- I learned to skate and it helped me learn to ski
- I learned English and it helped me learn German

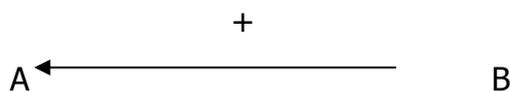


2) Proactive interference



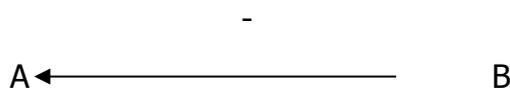
- the negative influence of a previous activity on a subsequent activity
- subject matter A negatively influences subject matter B
- I learned to play table tennis and it hindered me when learning to play tennis
- I learned English and it 'confused' me when learning German

3) Retroactive facilitation



- the retroactive positive influence of a current activity on a previous activity
- subject matter A is retroactively positively influenced by subject matter B
- current study of a foreign language helps me retroactively to be aware of the specifics of the Czech language
- a newly acquired motor skill improves a previously acquired skill

4) Retroactive interference



- the retroactive negative influence of a current activity on a previous activity
- subject matter A is retroactively negatively influenced by subject matter B
- current study of a foreign language retroactively interferes with previously acquired knowledge in another language



- a newly acquired motor skill causes a decline in a previously acquired skill

Transfer is explained using a dual theory, namely a specific and a non-specific transfer.

A specific transfer based on the theory of identical elements is characterised by '*a vertical transfer of knowledge and skills from one subject to another in an identical or content-related form*' (Hartl and Hartlová, 2010, p. 456).

According to Hartl and Hartlová, in the case of a non-specific transfer, this is a horizontal lateral transfer in which generalisation plays an important role. It is manifested by the ability to transfer understood relations and acquired principles to new situations, less similar than or different from what the learner learned in the past. The acquisition of certain thought operations enables one to repeatedly use them when solving assigned problems and various life situations.

Example:

Specific transfer = using knowledge from history in literature that is related to historic events

Non-specific transfer = skating, skiing (the ability to balance), general disposition applied here

From the lines above it is obvious that positive transfer is of benefit and very useful in learning and that negative transfer, i.e. interference, is undesirable. One has to resist interference, because otherwise a learner's efforts may be weakened or thwarted in the end.

A negative process occurs in similar (content-wise and form-wise) elements of subject matter. Therefore, one recommends becoming fully aware of this similarity (to compare the attributes of both activities, knowledge, skills, their



similarities and differences, etc.). Should we learn something with similar attributes, one has to start learning (training) the second activity only when the first has been perfectly acquired.

3.5 Stages of the Learning Process

The learning process usually proceeds gradually, which more or less enables one to define certain segments of this process, i.e. its stages. The key to distinguishing the approaches to breaking the process of learning into stages is the 'point of view': whether we view learning through the eyes of the learner or through the eyes of the person who teaches (teacher, lecturer, coach, etc.).

From the point of view of the learner (pupil), we have already provided learning stages that are related to sensorimotor learning and to problem-solving (see sections 3.1.1 and 3.1.3).

From a more general point of view, a learner usually goes through four main stages:

- a) orientation – initial orientation in the subject matter;
- b) preparation – determination of the goals of learning and a plan to achieve them (including the creation of a temporal and spatial outline that will enable one to acquire the subject matter);
- c) realisation – actual acquisition of the subject matter up to the level of learning it;
- d) verification – assessment of the level of acquisition of the subject matter, either by the learner him/herself or through external assessment.

In this division of the learning process, and in the following ones as well, one must point out that we are submitting models of the learning process which in



concrete cases can differ in that the individual learning stages can overlap, all of them do not have to be present, etc.

The pupil learns, the teacher teaches. The teaching process occurs in the following steps:

- a) initial diagnosis → determination of the pupil(s)' level of education and rearing; carrying out a didactical analysis of the subject matter;
- b) prognosis → the teacher plans what (content, subject matter) he/she will teach and how (processes, methods); in a school environment, this means carrying out thematic plans, preparations, etc.
- c) realisation → actual instruction using the chosen methods;
- d) final diagnosis → an evaluation of whether the set (predicted) objectives have been achieved.

The final diagnosis stage becomes the initial diagnosis stage for another instruction cycle.

From a didactical point of view, the following process is traditionally recommended within the framework of an instructional unit:

- a) motivation → initial motivation, arousal of interest in the topic, etc.
- b) exposition → presentation of new subject matter using organisational forms and methods
- c) fixation → presented knowledge and skills are fixed through training and repetition
- d) evaluation → evaluation and verification of the level of acquired and comprehended knowledge and skills;
- e) application → usage, application of the acquired knowledge when completing tasks, assignments, projects and practical activities with a desirable degree of independence.



This is a basic scheme that can be adapted as needed with regard to the characteristics of the subject matter, the chosen didactical approach, and the characteristics of the pupils.

● **Practical Application of the Subject – Tasks and Activities**

Find concrete examples of human learning by imprinting.

Think about whether you have reached a plateau in your university studies and whether or how you have succeeded in overcoming it.

Try to recall your earliest memories. Find out how early-childhood amnesia is explained.

Write down any mnemonic devices you know. What principle are they based on?

Think about whether you have fixed your behaviour as a result of paradoxical reinforcement.

Carry out an analysis of your cognitive style.

Carry out an analysis of your learning style.

Based on your own experience, provide examples of positive or negative transfer in your studies.

● **Review Questions**

Provide various types of learning according to the processes and agents they apply to.

Provide and describe various types of learning according to their external form and applied approach.

What school skills are acquired through sensorimotor learning?

What are the stages of sensorimotor learning?

How can a learning plateau be overcome?

What memory stages do you know?

What affects forgetting?



What memory types do you know?

What types of inferences do you know?

Describe the individual stages of conceptual learning.

State the difference between convergent and divergent thinking.

What are the agents of socialisation?

What is the name A. Bandura associated with?

Describe the difference between cognitive styles and learning styles.

What internal and external factors influencing a learning style do you know?

Describe the learning styles according to Dunn and Dunn.

Think about which learning conditions affect a pupil's performance most significantly.

How can negative transfer (inference) be prevented in the most effective way?

State the possible stages of the learning process according to various criteria.

● Summary

There are many types of learning that we can categorise using a host of various criteria: according to the processes and agents they apply to, according to their external form and applied approach, according to the degree of deliberate intention, according to the subject of learning, and also according to the contribution of the subject of learning to this activity. From the developmental point of view, we distinguish simple forms of learning, specifically human forms of learning, and special forms of learning.

Sensorimotor learning is the acquisition of motor skills and entire motor structures. These motor skills also include 'school' skills such as reading, writing, drawing and others. The basis of sensorimotor learning is the connection of perception with movement. One can distinguish movements with



a prevalence of reactive components (simple movements) and with a prevalence of operative components (skills, good habits and bad habits). Sensorimotor learning has four stages: instruction, first attempts, practice and exit control. Through practice, our performance increases until we reach a level where our performance no longer improves, the so-called learning plateau. It can be overcome if there is a change in a) the conditions, b) the method, and/or c) the motivation of the learner.

Rote learning is the acquisition of knowledge by mechanical learning during which an understanding of the content does not have to be present. To make it more effective, one uses mnemonic devices. Traditionally, three stages of memory are distinguished: encoding, storage and retrieval. Memory is developed and perfected through activities and learning.

The process of *forgetting* is a general term for the changes in retention and recall that occur over time. Forgetting is ascribed to the extinction and deformation of memory traces in the central nervous system. From a temporal point of view, we traditionally distinguish short-term memory (seconds, minutes), medium-term memory (hours, days), and long-term memory (weeks, months, years).

Conceptual (thought) learning is based on the application of thought processes. This is a type of learning that involves understanding. Thinking is the highest form of cognition and is based on reinforcement of the relationships between objects and phenomena. Concepts, inferences and judgements are the products of human thinking. The stages of conceptual learning are initial generalisation, the process of analysis, and the balancing of the process of analysis and synthesis. Learning through problem-solving is a type of conceptual thinking and is often categorised as a special form.



Social learning is associated with social psychology. It deals in particular with socialisation, i.e. the integration of an individual into the society through imitation and identification. Social learning involves the acquisition of social experience and norms. This is a life-long process, with the largest advances and changes occurring in childhood and adolescence. The social groups that affect an individual and the individual persons with whom he/she enters into various relationships are considered socialisation agents. The various concepts of social learning include direct reinforcement, imitation, identification and internalisation, vicarious reinforcement, and paradoxical reinforcement.

One's cognitive style determines how one processes information. It is manifested in an individual's intellectual and perceptual activities and does not apply only to the pedagogical environment. The basic classification of cognitive styles stems from two mutually complementary scales. The first scale ranges from holistic to sequential and the second scale ranges from the tendency to visualise on the one hand to the tendency to verbalise on the other.

A learning style can be defined as a distinctive learning process which an individual prefers at a certain time. Individual learning styles are influenced by internal factors (personality characteristics and cognitive styles) and external factors (a teacher's teaching style, the form of the subject matter, learning conditions, social interaction). There are various concepts of learning styles. Dunn and Dunn investigated individual learning preferences and split them into four categories – preferred physical environment, preferred emotional needs, social needs, and preferred cognitive needs. N. Entwistle focused on various modes of student orientation and by combining them arrived at deep, surface, strategic and apathetic learning styles. The last categorisation is based on Kolb's experiential learning model. Learning styles can be diagnosed using direct and indirect methods. One of the most frequently used questionnaires in our country is the LSI – Learning Style Inventory.



Basically, learning conditions can be divided into internal and external ones. Internal learning conditions are related to the personality of the learner. External conditions include everything that influences the learning process 'from the outside', from climatic conditions to the concrete situation of the learner (parents, classmates, teachers, subject matter).

Learning transfer can help (positive transfer – facilitation) or make the process of learning harder (negative transfer – interference). From a temporal point of view, it can have a proactive influence (from the past to the present) or a retroactive influence (from the present to the past). It seems useful to reinforce positive transfer and to eliminate negative transfer in the learning process.

The stages of the learning process can be viewed according to multiple criteria (see for instance the stages of sensorimotor learning or learning through problem-solving). The stages of learning can also be viewed from two basic angles – from the perspective of the learner and from the perspective of the teacher.

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4 Psychology of Achievement Assessment

● Objectives

This chapter is devoted to the psychology of achievement assessment and aims to introduce the essence, function and types of assessment in a school environment. A special attention is paid to stereotypes that affect achievement assessment and that can intentionally or unintentionally distort it, and thus evoke feelings and experiences of injustice among pupils. Using the text of the actual chapter and tasks that are assigned for the topic at the end of the chapter, students get a basic insight into the essence of achievement assessment.

● Time Demands

5 hours

● Terms to Remember (Key Words)

Assessment; achievement assessment and its criteria; formal, group-relationship and individual-relationship norms; assessment agents and addressees; assessment function (motivational, cognitive, conative; instructive and educational); assessment as a means of education; summative and formative evaluation; achievement-assessment functionality principles; assessment objectivity; assessment stereotypes; halo effect; self-fulfilling prophecy; Pygmalion effect; Golem effect; luck and bad-luck attribution; assessment objectivity with regard to pupils' performance/results.



4.1 The Term 'Assessment'

Ottova všeobecná encyklopedie (Otto's Encyclopedia) defines assessment as the 'classification or hierarchisation of certain phenomena based on a mutual comparison of values that are ascribed to them' (2010, p. 463). In a monograph devoted to achievement assessment, J. Slavík (1999, p. 15) characterises assessment generally as 'a comparison of 'something' with 'something else', during which we distinguish 'better' from 'worse' and choose the 'better' or during which we try to find a way to remedy or at least improve the 'worse'.

Assessment in its spontaneous, intuitive and often unconscious form occurs at a high rate of frequency. We make judgemental assessments of someone or something many times a day. For instance: 'the soup is salty, hot or cold' – taste is the criterion and taste is relative; 'the neighbour is thin, fat, small or handsome' – very subjective notions of average weight and height, and some aesthetic sensibility are the criteria. In common life situations, judgemental assessment somehow precedes clarification of the criterion according to which I make assessments. I label someone as fat or stupid and often only subsequently – sometimes at the request of another person – I look for substantiation.

Regardless of whether it is done intuitively, in an unsubstantiated manner, or intentionally and thoughtfully, any assessment will always be a comparison of the assessed object (thing, situation, animal, person) with some more or less clear criterion or norm. At this point we ignore the possible rate of subjectivity/objectivity of the assessor and the relativity of the chosen criterion.

4.2 Achievement Assessment



In the case of achievement assessment by teachers, this should be a conscious, thoughtful and fully professional process. There must be clarity as to what criterion (norm) will be used for the assessment. In essence, we have three basic possibilities:

- 1) *Formal (official), ideal norm*: someone – experts, Ministry of Education personnel, state-leaving-examination creators, educational planners at school, etc. – determines whether pupils' performance, results and activities are optimal and desirable and if they are sufficient or insufficient. Pupils' concrete performance, results and activities are then related to this formal norm and compared with it (e.g. the grading code determines what performance by a pupil should be given an A, a B, etc). The guideline for assessing a pupil's behaviour at school is the School Rules of Order, which specifies what behaviour is within the norm and what breaches it and stipulates sanctions for such behaviour. It is obvious that the mechanical application of a formal criterion is insensitive to the individual peculiarities and possibilities of some groups of pupils and individuals.

- 2) Another applicable and frequently used assessment criterion is the *group-relationship norm* (Slavík calls it 'social norm'). In this case, the pedagogue compares pupils with each other within a group (school class) and with other groups (school classes). He/she ranks them from the best to the worst. For instance: 'If I give an A to Alena, I also have to give one to Marta'; 'If I make Petr repeat the grade, I also have to make Pavel repeat it'; If Ervín deserves a B for behaviour, then Egon deserves one as well', etc. When applying the group norm, one can overlook individual differences between pupils especially in their capacities and abilities. This underestimation of pupils' ability to affect these differences, however hard they might try, often leads to their demotivation and the deterioration of their performance.



- 3) The application of the *individual-relationship norm* is the most sensitive psychologically. In this case, the teacher compares pupils' current performance, results and activities with their previous ones. Even small improvements, which are far from the 'ideal' norm and which mean that the assessed pupil is still hopelessly last (according to the group norm) among other pupils, can be reason for praise, encouragement, moving forward, etc. It is obvious that the use of the individual-relationship norm is necessarily associated with oral assessment.

In pedagogical practice, it is necessary to responsibly combine various assessment criteria (norms) and to not omit the application of the aforementioned *individual-relationship* norm when possible.

Elsewhere, Slavík (1999) tries to provide an overview of the relationships among all achievement-assessment participants, i.e. the agents and addressees of the assessment: the teacher assesses pupils; the teacher assesses him/herself; the teacher assesses his/her instruction methods; the pupil assesses a classmate (classmates); the pupil assesses him/herself; the pupil assesses the teacher; the pupil assesses the teacher's instruction methods; parents assess the pupil; parents assess the teacher; parents assess the teacher's instruction methods; a professional assesses the class (teacher, pupils). This professional can be a member of the school management, a colleague or a school inspector. This list is interesting also as to which of these assessments are used 'pedagogically'.

Jan Slavík considers achievement assessment to be '*all assessment processes and their manifestations that directly influence school instruction or attest to it*' (1999, p. 23). The question is whether to narrow down a succinct achievement assessment to instruction only. One also has to emphasise that achievement-assessment influences can have not only a direct impact, but also a long-term



one and an indirect one. However, the aforementioned definition expresses the basic attribute of achievement assessment, i.e. it cannot be narrowed down to grading (rating). The teacher's face expressing agreement or disagreement, the tone of his/her voice, a whole range of informal assessing statements, etc. undoubtedly constitute a form of assessment.

4.3 Functions and Types of Achievement Assessment

Achievement assessment is a special case of general assessment. This assessment fulfils several functions. According to Slavík (1999), these functions are (1) motivational (related to emotions), (2) cognitive (related to the cognitive aspect of assessment), and (3) conative (related to the person's will and his/her activity).

From a different – more traditional – perspective, achievement assessment fulfils the following functions:

- informative (verification, feedback) – especially towards the pupil and the teacher, but also towards the parents;
- instructive – allows for the specification, addition and correction of acquired knowledge by pointing out mistakes or deficiencies in the quality of then acquired subject matter (e.g. written corrections of mistakes made in a quarterly written assignment, helping the pupil to understand the subject matter during an oral examination, etc.);
- educational – regular assessment strengthens a pupil's tendency to prepare carefully and systematically and to complete the assigned tasks; this in turn strengthens and develops some personality features that are of key importance for the acquisition of knowledge and skills: responsibility, perseverance, purposefulness, etc.



We must continuously remind ourselves and make ourselves aware of the fact that assessment is a means or a tool to acquire knowledge, skills and habits and to develop desirable opinions, attitudes and personality properties; this constitutes a fundamental and superior principle of using assessment at school. Assessment is not a goal. It is detrimental if pupils study to earn a certain mark and not to learn. We do not study to earn marks, but to acquire knowledge and skills.

Slavík distinguishes between summative evaluation and formative evaluation. The idea behind summative evaluation is *to get a final general overview of achieved performance* (1999, p. 37). It is about making decisions regarding the acceptance or non-acceptance of a student into a university or for a job, enabling one to advance to a higher grade, etc. The long-term grading of a pupil (marks on the half-year and end-of-year school reports, secondary-school leaving examination, exams and final exams at university) is a type of summative evaluation.

According to Slavík, summative evaluation should build on *long-term, thought-out work with formative (corrective, feedback-based) evaluation*. This *provides assessment information at a time when a certain performance or activity can still be improved upon* (1999, p. 38).

A specific form of assessing pupil achievement is an exam in two basic forms: written and oral. The results are marks or oral assessment. The advantages and disadvantages of marking and oral assessment are dealt with in more detail in a chapter in Kolář and Šikulová (2009).

The functionality of assessment increases if it is timely, just and with clear rules. *In other words, a teacher should never assess his/her pupils for something other than what has been agreed and determined in advance*



between him/her and the pupils or for something that does not relate to the subject of the assessment (Kolář and Šikulová, 2009).

The following 'ten commandments' express the requirements for functional assessment in more detail:

1. It should be clear to the pupils what will be required from them and when.
2. The pupils should have the opportunity to correct their failures under clearly set conditions.
3. The teacher must try to ensure that his/her examination and grading are not influenced by his/her like or dislike of a pupil.
4. Grading and examination should not serve as a tool for punishing pupils (e.g. for lack of discipline).
5. The teacher explains the assessment criteria and adheres to them.
6. He/she makes sure that the pupils understand the instructions.
7. He/she prevents cheating and unfair conduct by the pupils.
8. He/she provides feedback as quickly as possible (e.g. timely correction of written assignments, analysis of mistakes, etc.).
9. Grading is a teacher's tool to increase the level of performance and to improve the results of the pupils.
10. The assessment of pupil performance (grading in particular) will be substantiated by the teacher so that the pupil accepts it as being deserved.

4.4 Objectivity of Achievement Assessment

The psychological limits of applying objectivity when assessing achievement are introduced by Slavík using a suggestive question: Can achievement assessment be objective? With regard to achievement assessment, we can consider any assessment to be objective if it is independent of the person who assigned the task, test, etc. and –foremost – of the assessor. This means that a pupil's concrete performance, result or activity is assessed similarly by various



pedagogues. Setting exact criteria is of help here: e.g. if a test on historical years containing ten questions is given, an A will be awarded to those who get all ten answers correct; a B will be given to those who get eight or nine correct; a C will be given to those who get six or seven correct; a D will be given to those who get five correct answers; and all others will get an F. We set similar criteria for all outputs that result from convergent thinking and when the correctness of one's knowledge or skills can be unambiguously assessed. In order to make the assessment objective in this way, one uses didactical (knowledge) tests repeatedly.

However, not all pupil knowledge and skills can be assessed according to the aforementioned model. It is hard to find unity when assessing essays or compositions and even harder when assessing performance in art and literature.

The problem with making achievement assessment objective is not connected only with the subject matter, but to a significant extent with the assessor/teacher. Helus includes the so-called perception-attitude orientation of the teacher among the agents which influence the functionality of instruction. He points out that:

- (a) our perception of people is usually not neutral, impartial or unbiased;
- (b) the way we perceive another person and the impression he/she evokes in us result in our attitude being manifested in the way we deal with this person;
- (c) the percept and related attitude are usually of a reactive character, they are evoked in us unwittingly, i.e. without us realising them or without us willing to admit them. (Helus, 2007, p. 230)

According to Helus, this perception-attitude orientation is manifested prevalingly in the form of the halo effect and self-fulfilling prophecy.

The 'halo effect' involves unwittingly succumbing to the tendency to orient oneself in one's conduct with another person according to this other person's



partial properties, manifestations or physical characteristics that have come so much to the forefront that they significantly influence one's overall impression of this person, one's attitudes toward him/her, and one's conduct with him/her. (Helus, 2007, p. 231)

The halo effect is created through the influence of a whole set of perceived facts, ranging from marked characteristics (eccentric clothes, striking make-up, piercings, etc.) to more subtle non-verbal and verbal expressions (facial expressions, intonation, quiet vs. loud speech, rich vs. poor vocabulary, etc.). Helus states that the primacy effect, which teachers succumb to quite frequently and which, if the impression is negative, the pupil can change only with difficulty, is a specific form of the halo effect. Helus further warns against complications that can be caused by the teacher's tendency to 'categorise' the class into good and bad pupils using so-called contrast perception.

Favouring pupils or picking on pupils is a bad habit many people have encountered personally during their school years. A teacher can favour a pupil unknowingly, without being aware of it. If he/she does this knowingly, it is a gross professional failure. However, the unsubstantiated conscious or unconscious favouritism of a pupil will be noticed by his/her classmates and the teacher will then lose his/her credibility with them. It is still valid in the teaching profession that pupils do not forgive us two types of failure: injustice (this favouritism) and requiring adherence to something that the pedagogue him/herself is in breach of or does not adhere to. This can be expressed by the saying 'You should practice what you preach.'

The term 'self-fulfilling prophecy' involves a phenomenon called the Pygmalion effect. It was described on the basis of known and frequently cited research studies by Rosenthal and Jacobson published in 1968 in the book *Pygmalion in the Classroom* (e.g. Helus, 2007; Hartl and Hartlová, 2010; Průcha, Walterová and Mareš, 2003; Petty, 1996, etc.). The authors of the Pedagogical Dictionary (*Pedagogický slovník*) define the Pygmalion effect as



a figurative label for the consequences of a teacher's positive expectations. The teacher's expectations stem from his/her thinking that there is a chance for the student to improve his/her marks and behaviour. The Pygmalion effect works on the principle of self-fulfilling prophecy – the teacher does all he/she can to prove him/herself right. (Průcha, Walterová and Mareš, 2003, p. 194)

The teacher's strategy of working with the pupil is based on encouragement, praise and appreciation of the pupil's efforts until the teacher succeeds in convincing the pupil that he/she can do it and he/she really improves. The pupil adopts the teacher's positive expectations and fulfils them. The risk of this strategy lies in the possible abuse of the teacher's favour when the pupil realises that the teacher perceives him/her positively and then 'takes advantage' of this.

The opposite of the Pygmalion effect is the Golem effect. In this case, the teacher also starts out thinking about the pupil's possibilities, but he/she assesses them negatively. The teacher's behaviour toward the pupil then corresponds to his/her expectations: the teacher shows dissatisfaction with the pupil's performance, underestimates him/her, criticises him/her, suspects him/her of cheating, and lowers his/her self-confidence. In the end, the teacher succeeds when the pupil realises that regardless of how hard he/she tries, he/she has no chance with this teacher and stops trying and starts behaving according to the teacher's expectations (see Helus, 2007; Hartl and Hartlová, 2010; Mareš and Křivohlavý, 1995; Průcha, Walterová and Mareš, 2003). The Golem effect attests to quite a common phenomenon of transferring the responsibility for failure at school exclusively to the pupil. On the other hand, teachers claim responsibility for their pupils' successes at school.

The teacher's interpretation-attitude orientation is considered by Helus to be a significant factor in communication between the teacher and the pupil. Here we



come to the term 'causal attribution'. Helus points out that this is not a scientific and systematic search for causes, but a process that

we do unwittingly, as we go along, without having the time, the interest or other preconditions to get to the depth and the core of the issue. (Helus, 2007, p. 241)

The authors of the Pedagogical Dictionary (*Pedagogický slovník*) emphasise the fact that attribution processes influence teacher-pupil relationships in particular. The causes can be categorised as external and internal (see later in the text); stable (difficulty of the subject, clearly defined attitude of the teacher) and unstable (attention, tiredness, luck); and influenceable (pupil's effort and perseverance) and non-influenceable (low level of ability, bad luck) (compare Průcha, Walterová and Mareš, 2003).

Helus distinguishes between bad-luck (Slavík: discouraging) and luck (Slavík: encouraging) attribution, in which internal and external and stable (permanent) and unstable (variable) causes are at play. He illustrates 'bad-luck attribution' using the following example:

The teacher explains a pupil's *success* using external causes: he/she was lucky ('Luck was on his/her side.'), he/she cheated ('There's no other explanation.'), etc. The teacher explains a pupil's *failure* using stable causes: he/she failed because he/she cannot do it, he/she is not good enough.

In the case of 'luck attribution', on the other hand, the pupil was positively affected by a situation in which the teacher explains his/her success using internal causes (the pupil is talented, he/she has developed volitional and moral properties, etc.) and his/her failure using unstable causes (momentary indisposition, tiredness, lack of concentration, etc.). Luck attribution increases a pupil's self-confidence, helps him/her be successful in the future, and even



failure does not demoralise him/her, as he/she perceives it as an episode that can be overcome (for more, see Helus, 2007, pp. 241–243).

A good teacher can work with pupils' mistakes. The saying 'We all learn from our mistakes' applies here. Mistakes are a natural component of the learning process (see earlier in the text, for instance the explanation of the stages of sensorimotor learning). Another bad pedagogical habit is 'premature examination', which takes place before the pupils have had a chance to thoroughly acquire the subject matter. Such 'unlearned' subject matter is abandoned after 'premature' grading and subsequent subject matter is dealt with in a similar manner. This means that the teacher is satisfied with discussing the subject matter and grading it, but not teaching it.

Let us return to the issue of objectivity with regard to achievement assessment. Its subjectivity is manifested by various teachers dissimilarly assessing pupil performance, by various teachers dissimilarly assessing the same performances of various pupils, and by the same teacher changing his/her criteria over time, i.e. he/she is not consistent in his/her assessments.

Slavík considers any effort made to achieve objectivity in assessment to be praiseworthy, especially when it allows us to avoid mistakes and errors. Nevertheless,

hard – mechanical – objectivity is of no great value in achievement assessment if it is not accompanied by quality pedagogical communication. However, in no case does this mean that we should not strive to achieve the highest possible assessment objectivity. We just cannot forget that assessment objectivity alone is not an objective, but only a means of education at school. (Slavík, 1999, p. 62)

The criterion of objectivity therefore cannot be put before the benefit of the pupil(s). In the interest of the pupil and his/her development, the teacher is not



only entitled to, but also obliged to be 'non-objective'. Good teachers know when to 'add' to or 'subtract' from a pupil in order to help him/her achieve more at school.

● Practical Application of the Subject – Tasks and Activities

Think about what types of achievement assessment you encountered in primary and secondary school.

Did your teacher apply all three of the basic criteria of achievement assessment? Which one prevailed?

With the help of the chapter *Známkovat či hodnotit slovně (Grading or Verbal Evaluation)* (Kolář and Šikulová, 2009), analyse the advantages and disadvantages of these forms of assessment.

How often have you encountered the application of the individual-relationship norm?

Describe any experience you may have had with the Pygmalion effect and/or the Golem effect.

What manifestations of non-objectivity have you encountered in achievement assessment?

● Review Questions

Explain the essence of achievement assessment.

What functions does achievement assessment fulfil? Analyse them using concrete examples.

Characterise a formal norm, a group norm and an individual norm.

Explain the differences between formative and summative evaluations.

What is the essence of a self-fulfilling prophecy?

How does the Pygmalion/Golem effect manifest itself in a teacher's behaviour?

What effects do 'luck' and 'bad-luck' attribution have on pupils?

What is the problem with objective achievement assessment?



● Summary

Generally, assessment means the comparison (classification, hierarchisation) of something with something else according to a chosen criterion.

In the case of achievement assessment, three basic criteria can be applied: 1) formal (ideal) norm, 2) group-relationship (social) norm, and 3) individual-relationship norm. Slavík defines achievement assessment as *'all assessment processes and their manifestations that directly influence school instruction or attest to it'* (1999, p. 23).

The functions of achievement assessment have traditionally been informative, instructional and educational. From another perspective, we distinguish a motivational, a cognitive and a conative function (Slavík).

The basic rule for the application of any achievement assessment is its understanding as a means, a tool to achieve educational objectives. This thought is followed by distinguishing between formative and summative evaluation.

The functionality of achievement assessment lies in its timeliness and fairness, and the determination of clear rules (more details earlier in the text).

In reality, there are a host of variables (Helus) that complicate the objectivity and functionality of achievement assessment. These include the halo effect, self-fulfilling prophecy (the Pygmalion effect), the Golem effect, and processes of attribution (luck vs. bad-luck attribution).



Slavík warns against mechanical objectivity. It can be counterproductive and consequentially obstructive and non-motivational for pupils.

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5 Psychology of Family Upbringing

● Objectives

In this chapter we describe the essence of family upbringing, whose role is of key importance in the development of the child and adolescent. At the beginning of the chapter, we introduce the family as a social-psychological unit with specific characteristics. Further explanation focuses on family types and functions. The focal point of the chapter, however, lies in capturing the changes in the family, including contemporary trends. This approach enables one to understand the basic internal and external variables that affect upbringing in the family and offers interconnection with the students' own experience.

● Time Demands

4 hours

● Terms to Remember (Key Words)

Family as a social group (small, primary, semi-formal, reference); family types (complete, single-parent, blended, foster, two-generation and multi-generation, family of orientation and procreation); historic view: authoritative-patriarch and democratic-partner family model, their positives and negatives; basic family functions (economic, biological and rearing); trends and attributes of the contemporary family; rearing strategies and styles of family upbringing (authoritative, liberal, spoiling, perfectionist, neglectful, immature, cast-off, overburdened, dissociated and clueless); nine-square model; role duplication; pedagogues in the parental role; differences between institutional and family upbringing.



5.1 The Family as a Social-Psychological Unit

Fontana (1997) claims that the family is the most important unit in the social development of a child. From the aspect of social psychology, the family is a small, primary group. The family unambiguously contains all of the attributes of a small group (up to ten members – very exceptionally more – and face-to-face contact). For the majority of people, the family is also a primary group, characterised by intimate relationships, strong emotional relations, and satisfaction of the basic needs of its members. The absence of some family member considerably affects the lives of all the other members. Actually, this applies to any change in the structure of family relationships.

It seems more complicated when it comes to categorising the family among formal groups or informal groups. Usually, a family originates based on the future partners becoming closer informally. An originally non-binding relationship is formalised by marriage and subsequently by parenthood (see Act No. 94/1963 Coll., on the family). Informality prevails in family relationships and strict – ‘written’ – norms are absent, but an adherence to unwritten rules is required. For these reasons, we can talk about the family as a semi-formal group.

The family is – or should be – a relational group, in particular positively relational. This means that there should be equilibrium between membership and positive relations to this membership. Ideally, no family member should desire to be a member of another group outside his/her own family.

5.2 Family Types and Functions

Families can be classified according to certain attributes. Traditionally, one distinguishes the complete family (both parents, children), the single-parent family (one parent is absent), the blended family (currently a significant increase in their number with regard to the frequent disintegration of original



families), and the foster family (children are brought up in a foster family or by their grandparents, etc.).

Another criterion enables one to distinguish between two-generation (nuclear) and multi-generation families (see further in the text) and between a family of orientation (the position of a child) and a family of procreation (the position of a parent).

The family fulfils a host of functions that are usually divided into basic functions, including the following: a biological function (the family in particular fulfils a reproductive role and within this framework erotic and sexual needs are satisfied), an economic function (each family is essentially a small economic unit), and a rearing function (the family is the basic socialisation environment for the new generation). Other family functions include the following: an emotional function (a child's emotional aspect cannot be fully developed outside the family), an emotional background and safety function, a cultural function, an educational function, a recreational function (ever more prevalent), etc. If a family does not fulfil some function, we speak about it as being a partially or fully dysfunctional family.

5.3 Transformation of the Family

The family as a social unit has been continuously developing. From the historic point of view, we can see the gradual transformation of the family from the authoritative-patriarch model to the democratic-partner model (the second half of the 20th century). The *authoritative-patriarch model* is characterised by the dominant position of the father, who is the family breadwinner, and the subordinate position of the mother, who is economically dependent on her husband. It is socially expected from the woman to fulfil the roles of mother, partner and housewife. This family model provided children with stability. Separations or divorces were rare and associated with social condemnation.



The aforementioned stability was based on the unequal position of the woman. The man had no reason for divorce (even infidelity was tolerated) and the woman, regardless of how unhappy she was in the marriage, could not get divorced, as economic and social reasons prevented her from doing so. The great novels of the 19th century depict this issue very well (e.g. Tolstoy's Anna Karenina and Flaubert's Madame Bovary).

The secularisation and liberalisation processes supported by the tragic events of the 20th century (a decrease in the male labour force as a result of both world wars) paved the way for women's professional employment and thus to their emancipation in marriage. Women became more economically independent and more self-confident, and there was a gradual change to a *democratic-partner* family model. Women are more and more successful in qualified professions, even in those that used to be the domain of men (physician, judge, police officer, etc.). They thus become a professional model for their daughters. They are no longer just models for mothers and wives. Nevertheless, the modern (or contemporary) family shows a certain degree of instability, which is naturally negatively reflected in children's upbringing (for more, see Matoušek, 1997).

O. Matoušek (1997, p. 30) lays out the trends that are typical of the contemporary family:

- Tendency to put off marriage and child-bearing as long as possible;
- Tendency to start a family informally, without legal marriage;
- Increased divorce rate;
- Lower willingness of people to enter into another marriage and to have more children;
- Tendency to limit the number of children in the family or to have no children at all;
- Prolongation of the period during which adult children live together with their parents ('mama hotel').



We should add the following to the aforementioned: The number of women opting for the career of 'single' mother is increasing. There are more and more women who are putting their professional career ahead of their role as a mother or for whom their career is as important as being a mother. At the same time, there are increasing numbers of men and women who are deciding to live outside marriage and without children. Vágnerová says it is a myth that all normal people should want to have children and should look forward to having them. She points out that the relationship with one's child can be created gradually after the child is born. Based on foreign research studies, she says that *the more romantic, i.e. the less realistic, the ideas young people had about parenthood, the more difficult adaptation to parenthood was* (Vágnerová, 2000, p. 347).

The overall liberalisation of the society is also manifested in the tolerance of alternative lifestyles that were formerly subject to taboo or hidden, or that people 'turned a blind eye to'. This applies especially to contemporary society's open and accepting approach towards homosexuality. In the past, there also used to be social pressure on young men and women to enter into marriage and to have children. If someone remained single, it was considered somewhat 'unnatural'. The names for such people had a pejorative connotation to them: 'bachelor' and 'spinster'. Contrary to then, today it is modern and trendy to be 'single'.

Matoušek (1997) critically summarises the described trends in the development of the family and expresses his belief that the assertion of individual interests over family interests prevails. Elsewhere, he speaks about 'third-wave' families that are not established because of children but are families in which the satisfaction of the interests of the adults always comes first.

5.4 Attributes of the Contemporary Family



Helus characterises the contemporary family using five attributes:

(1) He calls it nuclear. This attribute is based on the fact that it is composed of a few people that make up its core and mutually share intimate co-habitation.

(2) This core is made up of spouses/partners who are the parents of their children or who care for '*adopted children or children from the husband's or the wife's previous marriages*' (Helus, 2007, p. 137).

(3) This is a two-generation family – father, mother and children. In this connection, Fontana distinguishes between a more narrow (two-generation) and a broader (multi-generation) family. The more narrow family consists of first-degree relatives (parents, children) and the broader family includes second-degree and third-degree relatives (grandparents, uncles, aunts, cousins, etc.). Fontana considers the consequences of the decreased importance of the broader family. He believes that social mobility causes young people to move far away from their parents and to bring up their children away from their grandparents and other relatives. He considers it one of the causes of a decline in social inhibitions and more frequent violations of law and order.

At the time when children were brought up in the environment of the broader family and the familiar world of neighbours and friends, they were much more exposed to the pressures of social conformity than they are today. (Fontana, 1997, p. 37)

When we add to that the increasing number of people who are moving to large, anonymous, urban agglomerations, it is no wonder that our youth are not being brought up in any way by 'public opinion'. This trend has resulted in an increased absence of intergenerational respect towards adults and in particular towards the elderly.

(4) According to Helus, the fourth attribute of the nuclear family is the fact that it functions as 'a private space'. It is a family with intimate relationships.

(5) The fifth attribute that enables us to understand the contemporary family is called 'private individualisation' by Helus. This is



a breaking free from the manacles of tradition, historically handed down habits and commitments, property, and professional predetermination; it also means needing to decide and to choose, to be responsible for one's decisions, and to deal with oneself. (Helus, 2007, p. 139)

The acquired autonomy of the nuclear family is thus associated with a certain uprooting that lies in the loss of the natural transfer of traditions, rituals, styles of upbringing and intergenerational relations.

Nevertheless, it is methodologically very difficult to study the contemporary family and to capture its basic developmental characteristics, as I. Sobotková points out:

Any study and research into the area of family interaction and family functioning involves certain special problems resulting from the actual essence of the family. (Sobotková, 2007, p. 110)

5.5 Upbringing Strategies in the Contemporary Family

It is natural that the aforementioned family transition is also reflected in parental upbringing strategies when caring for children in the family. It is influenced by the general liberalisation of the family environment on a horizontal level (between spouses, partners and siblings) and particularly on a vertical level (looser relationships between parents and children). The liberalisation of the relationships between parents and children is of benefit due to the resulting greater intergenerational openness in both directions. Never in the past was communication between parents and children as friendly as it is now, with children having the opportunity to speak to their parents 'about practically everything'. Of course, this openness is augmented by the mass media and easy opportunities to learn information that would have been inaccessible to or hard to access for previous generations. On the other hand,



the internal liberalisation of the family environment leads to lower demands placed on the new generation. To a greater extent, family life adapts to the needs of the children; there are fewer duties they should fulfil and they have more freedom ('they do not have to do anything'). This trend is natural in connection with the increasing quality of life and mainly the penetration of modern technologies into everyday life. The negative consequences of upbringing in the contemporary family seem to be decreasing respect towards authority and a lower ability and willingness to be subject to rules and to acquire the habits of 'polite behaviour' (see the absence of public control earlier in the text).

The following styles of family upbringing are traditionally considered problematic: *authoritative* (strict), *perfectionist* (ambitious, with high demands for the child's performance), *spoiling* (currently especially in the form of materialistic 'over-sating' of the child), *liberal* (free upbringing without rules and limitations), *protectionist* (anxious, protective), and *neglectful* (can be identical to dysfunctional upbringing).

Lašek and Loudová (2013) add additional unsuitable approaches to family upbringing. They include families that are *immature* (parents too young, without life experience, immature for the parental role) or *overburdened* ([...] 'parents cannot escape the pressure of tasks and problems [...] that cause the child to be at the edge of their interest', Lašek and Loudová, 2013, p. 11). They also include the *cast-off* family (with a prevailing tendency to at least temporarily get rid of the children and entrust them to someone, to deal with the children as little as possible, etc.) and the *dissociated* family (relationships in the family suffer from permanent conflicts and disputes).

To a greater extent, clueless 'child-rearing' is a new phenomenon, i.e. there are increasing numbers of parents (mothers) who very soon are unable to deal with the behaviour of their children. Often, the father as a male role model is absent



from such families. The connection with the instability of the contemporary family is clear. Family disputes and separations that make children uncertain are compensated for by the children in their indiscipline, aggressiveness and poor school performance.

The issue of upbringing styles was laid out in a beneficial manner by J. Čáp in his so-called *nine-square model*. This model combines two dimensions: 1) the emotional relationship of the parents towards the child (negative, negative-positive, positive, extremely positive) and 2) the level of leading/controlling the children (strong, moderate, weak, contradictory) (see more in Čáp and Mareš, 2001, pp. 306–308).

Following the idea of O. Matoušek in which the members of the contemporary family give priority to the satisfaction of their individual needs, we can state that many parents have grown comfortable and their children's upbringing has been narrowed down to the satisfaction of their material needs. They are less willing to do things for them and give them their time. It is a myth that today's parents do not have time for their children. Why should it be so in modern times when the majority of households are equipped with appliances that make household chores significantly easier, when the working hours are still eight hours a day, and when weekends are available to spend leisure time together? The aforementioned technological progress helps parents to be comfortable. To a greater extent, children can entertain themselves and spend time without parental contact (computer games, chat, the Internet, etc.).

A successfully managed parental role assumes that parents will succeed in letting their children know distinctly that:

- *they are welcome in their world,*
- *they can be themselves, with what ever qualities they have,*
- *they are entitled to live according to their age,*
- *they can cuddle with their loved ones,*



- *they have the right to feel what they feel (joy, sadness, fear or anger),*
- *they can think and ask questions,*
- *they have the right to be successful.*

The children will then develop freely according to their individual abilities (Kern et al., 2006, pp. 203–231).

5.6 Pedagogues in the Parental Role

Pedagogues (especially teachers and educators) are professionals in the area of education. They have the necessary pedagogical qualifications and practical experience from their educational employment. On the other hand, the majority of non-pedagogue parents are not professionally prepared to play the parental role and to a great extent bring their children up intuitively or by trial and error. The processes and methods of upbringing experienced by the parents themselves when they were children are often applied.

Role duplication occurs in parent-pedagogues. When viewed more shallowly, it seems natural to expect that the children of teachers and educators would somehow 'automatically' be well brought up and exemplary. Their parents are pedagogically educated and have experience in educating pupils. However, the reality is usually much more complicated. And many times, surprisingly, the saying 'It's the cobbler's children that go barefoot' is true.

Even the parent-pedagogue – similarly to other parents – has a strong emotional relationship with his/her own child, which is of course desirable but to a great extent makes it more difficult to view the attitudes and behaviour of his/her offspring more objectively. With other, 'strange' children, he/she can easily diagnose the motives behind child behaviour and react accordingly, but



with his/her own child, due to the parental 'emotional screen', he/she can be less successful in his/her upbringing interventions.

Another variable that can make the educational activities of pedagogues regarding their own children more difficult is their professional weariness. Especially the teachers and educators of younger children are repeatedly forced to check on their pupils, to explain, to repeat 'something' all the time, to instruct, to keep an eye on things, and also to reprimand and punish. It is not surprising that often when they come home, the 'second shift' with their own children awaits them, and it is also not surprising that many times they do not have the strength to fully play this educational role.

Increased expectations regarding their children's behaviour can be a complication in the upbringing of the children of teachers and educators. Related to this are the more demanding set criteria associated with the assessment of the behaviour of teachers' children. Some parent-pedagogues are often only too aware of the fact that their children are viewed more strictly and that they bring themselves to admit their offences more. The sentence in which these parents tell their children that they are bringing shame on them has become so unpopular with the children of pedagogues that many children start bringing this shame on their parents out of spite.

5.7 Institutional vs. Family Upbringing

The difference between institutional (schools, youth homes and other educational facilities) and family upbringing lies foremost in the fact that institutional upbringing (education) is implemented by professional pedagogues whereas parents usually bring their children up in a lay ('amateurish') and unqualified manner. They usually have not undergone any systematic training that would prepare them for their role as parents (see earlier in the text).



Education and upbringing in schools and other educational institutions are developed in a planned and systematic manner. School education primarily targets the development of the cognitive aspect of children's personalities, even though a good school and good teachers also shape the emotional, volitional, social and moral aspects in a desirable direction.

Family upbringing is based on strong emotional relations and therefore is more intuitive and episodic and less systematic and rational.

Family upbringing is irreplaceable especially in the development of the child's emotional component. The absence of a loving family upbringing necessarily has serious consequences. An emotional deficit and emotional shallowness appear in the child's behaviour, which can result in aggression, self-aggression, cruelty, vandalism, and in the end in the search for substitute relations in the form of various addictions (from alcohol addiction to computer addiction).

The specificity of family upbringing also lies in that it is usually applied before the start of institutional upbringing (parents work with their children from a young age). Another attribute of family upbringing is the long-term upbringing effort of the same people, i.e. the parents (this does not fully apply to families in which, for whatever reason, there are changes in the persons with a direct upbringing influence on the children). Even teachers at school influence the pupils' personalities over the long term; however, during the attendance of primary and secondary school, several dozen pedagogues will oversee and influence one group of pupils (school class).

When we speak about the differences between institutional upbringing and family upbringing, it must be mentioned that the basis of a child's desirable development is the close and mutually enriching co-operation between both forms of education: institutional and family. Pedagogical manuals discuss the



methods and forms of co-operation between the family and the school in more detail (see Krejčová et al., 2005).

● Practical Application of the Subject – Tasks and Activities

Find the current divorce rate (including statistics that try to capture the causes of this phenomenon) in relevant sources.

Do a survey around you investigating the age of first-time mothers in your parents' generation.

What can complicate upbringing in blended families?

What are the advantages and risks of multi-generational family co-habitation?

Try to predict the trends in family development over the next two decades.

Analyse what the difficulties are with regard to family-focused research studies, and substantiate your findings using literature sources (Sobotková: *Psychologie rodiny*, Možný: *Sociologie rodiny*).

Search the literature for the two-dimensional model of family upbringing (the so-called nine-square model, Čáp and Mareš, 2001).

● Review Questions

Characterise the family as a social group.

Categorise families according to various criteria.

State and characterise the basic functions a family fulfils.

Provide an insight into the variables (historical perspective) that affected the family transition up to the contemporary democratic-partner model.

State and analyse the trends in the development of the contemporary family.

Clearly characterise the various styles of family upbringing.

Define the complications professional pedagogues may encounter when bringing up their own children.

Compare institutional upbringing and family upbringing.



● Summary

The family is first characterised as a social group. It is a small, primary, semi-formal and reference group. Families can be categorised according to various criteria. Most frequently we distinguish complete, single-parent, blended, foster, two-generation and multi-generation families. From another angle, we distinguish between a family of orientation and a family of procreation.

When using the historical criterion, we distinguish the authoritative-patriarch (older) and democratic-partner (newer and currently prevailing) models of the family. Among the basic family functions we include the biological, economic and rearing (and other) functions.

The trends of the contemporary family (Matoušek) characterise its long-term direction: a tendency to put off marriage and child-bearing as long as possible; a tendency to start a family informally, without legal marriage; an increased divorce rate; lower willingness of people to enter into another marriage and to have more children; to live and be single; a tendency to limit the number of children in the family or to have no children at all; prolongation of the period during which adult children live together with their parents; and overall liberalisation of the family environment.

Unsuitable strategies and styles of family upbringing include authoritative, liberal, spoiling, perfectionist, protectionist, neglectful, immature, cast-off, overburdened, dissociated and clueless. An interesting model of family-upbringing styles is Čáp's nine-square model.

A successful family upbringing from the viewpoint of the child is characterised by the child being welcome in the world of the parents, by being him/herself, by behaving authentically with regard to his/her current age, by freely



expressing his/her needs and opinions, by asking questions, by finding emotional satisfaction in his/her parents, and by being happy and successful.

Pedagogues in parental roles (role duplication) are in a specific situation in which they do not always succeed in applying their pedagogical specialisation and experience with education (in schools, youth homes, etc.) at home.

Comparing family upbringing with institutional upbringing helps us to understand its essence and peculiarities. The differences are mostly caused by the fact that institutional upbringing is realised by professional pedagogues, is more planned, more systematic, more rational and more focused on the development of the child's cognitive personality component. The irreplaceability of family upbringing lies in the development and satisfaction of the child's emotional needs.

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6 Psychological Aspects of Moral Development

● Objectives

The objective of this chapter on the psychology of morality is to emphasise two basic aspects of moral development. First, to show that moral development follows some kind of logic and can therefore be described. Knowing the stages of moral development next helps diagnose this development and – and this is essential for the pedagogical profession – subsequently helps influence it positively in pupils/children.

● Time Demands

4 hours

● Terms to Remember (Key Words)

J. Piaget; heteronomous and autonomous morality; development; relationship with rules; moral stories; damage from clumsiness; lies; thefts; intention of the acting person; punishment in the stages of heteronomy and autonomy; the significance of co-operation; N. Bull; pre-moral stage; external, internally external and internal morality; the process of interiorisation; L. Kohlberg; pre-conventional, conventional and post-conventional stages; the stage of egoism; reciprocity; sociometry; law-and-order orientation; social contract; respect for



the individual's rights; orientation toward the general principles of humanity; the function of conscience; moral dilemmas.

6.1 Introduction

Effective moral influence depends on understanding and respecting the logical stages moral development undergoes in ontogenesis. It was especially Piaget's and Kohlberg's work that helped improve orientation within the psyche of the individual on his/her way to moral 'maturity'. Piaget's distinguishing between 'heteronomous' and 'autonomous' morality (Piaget, 1977; Vacek, 2002) was followed by Norman Bull and later built on distinctly by Lawrence Kohlberg.

Piaget published *The Moral Judgment of the Child*, his seminal work on the psychology of morality, in 1932 (*Le jugement moral chez l'enfant*. Alcan, Presses Universitaires de France, 1932. In this text, we refer to the English translation of this work from 1977).

The aforementioned publication became the foundation of a commonly accepted theory of moral development and enabled many followers to creatively develop it. Piaget thus became the founder (or rather a co-founder with L. Kohlberg) of a relatively young, but today quite developed, psychological discipline: the psychology of morality (e.g. see Lapsley, 1996).

6.2 Piaget's Theory of Moral Development

Piaget's starting point is the observed fact that as much as children are different from adults in cognitive and personality development, they are also different at the level of moral reasoning. He identified two broad stages of moral development in the period between six and twelve years of age. Younger children are in the heteronomous stage and older ones (at around age eleven or twelve) are in the autonomous stage. Here, the educated reader sees a



connection with Piaget's stages of cognitive development: sensorimotor (up to two years of age), pre-operational (two to seven), and especially concrete operational (seven to eleven) and formal operational (eleven and older) (Piaget, 1970; Piaget, Inhelder, 1970; Slavin, 1988; Fontana, 1997; and others).

Piaget looked for the key to understanding the essence of a child's moral reasoning through analysing children's relationships with rules (Piaget, 1977). He investigated how children understand rules and how they obey them. In particular, he observed children playing marbles and at the same time asked them about their degree of understanding of the game's rules. Similarly to other children's games, children do not formally learn how to play marbles. On the contrary, they acquire the rules spontaneously without the influence of adults.

Rules play no role for the youngest children (up to the age of two). This is purely a motor activity and is not accompanied by any *a priori* playing intention.

In the second stage between the ages of two and six, the child observes the older players and starts imitating their activities. He/she is already aware that some rules exist that regulate the game and even though their knowledge is very superficial (general), the child considers them sacred and inviolable. At this age, the practical relationship with obeying the rules is egocentric. For the time being, the child is unable to understand play as a social activity. He/she has assimilated some elements of the social reality, for example that the activity is called 'playing marbles', but so far is unable to connect his or her playing with the other players. The child infers a feeling of pleasure from the psychomotor activity of developing his/her skills. Even though he/she has some kind of connection with the other children at play (he/she 'is playing' with them), each child, in fact, is playing his/her own game. Duska and Whelan (1975) call this combination of egocentric play and belief in the sanctity of the rules a special paradox. On the one hand, the child feels an unquestionable respect towards the rules that regulate play; on the other hand, he/she 'egocentrically' ignores and breaches these rules during the game itself.



In the third stage (between the ages of seven and ten), the child's development goes from satisfaction provided by the psychomotor activity in the two previous stages to satisfaction which is associated with his/her growing competence to take the set of agreed rules into account with the other players. The child's main interest is therefore no longer psychomotor, but social. At this age, children carefully observe each player to make sure he/she is playing according to the rules. They still do not understand the rules of the game completely, but they feel a strong need to play the game in the 'right' way. If there is disharmony among the players in the interpretation of some rules, in the majority of cases a strong desire to co-operate ('to play') prevails, and thus all disputable actions are omitted, all differences are settled, and all rules are purposefully simplified. These differences in the players' intentions and implementation of the game are probably more a result of a lack of knowledge of the rules rather than a lack of respect (Piaget, 1977).

At the age of eleven or twelve, codification of the rules in connection with the development of abstract thought becomes very important for the child. Children are interested in the rules as rules and often spend more time 'codifying' each possible situation that can occur while playing than actually playing the game. Their knowledge of the rules is already very good and no detail is omitted. This clarification of the rules already creates a structured framework for co-operation, which is highly desired by children. It therefore appears from the aforementioned that in this period we can find a very close correlation between the players' knowledge of the rules and their obedience to them.

In his research, Jean Piaget comes to the conclusion that the essence of all morality lies in the respect an individual has for a given set of rules. There are two types of respect and therefore two types of morality. One-sided respect leads to *heteronomous morality*, whereas mutual – equal – respect develops *autonomous morality*. At the level of autonomous morality, rules are obeyed not because of fear of punishment or under the 'strict' supervision of other people, but because they have been interiorised (see the process of



interiorisation in N. Bull's concept). Therefore, this autonomy represents *independence* from the influence of authority, because this respecting of norms stems from an individual's cognition of their correctness (as if from inside the personality). Any sanction for breaching the rules in this case does not involve punishment from the outside, but instead results in internal dissatisfaction with oneself (conduct against one's beliefs, pangs of conscience, contradiction of polite behaviour).

To investigate especially the heteronomous stage of a child's moral development, Piaget used pairs of moral stories in which the actors deviated from the rules in their conduct and broke or damaged something due to clumsiness, committed a theft, or lied. The majority of Piaget's moral stories are published elsewhere (see Vacek, 2013). For illustrative purposes, we provide the following example:

A. A young boy was walking down the street and met a big dog that scared him a lot. When he arrived home, the boy told his mother that he had seen a dog that was as big as a cow.

B. Upon returning home from school, another boy told his mother that he had got good marks at school, but this was not true. That day, the boy had not got any marks, good or bad. His mother was glad and rewarded him.

Young children judge guilt on the basis of the 'degree' of the lie, i.e. its distance from the truth (reality). The 'more disobedient' child is the child who in this sense tells a bigger lie. What would be called an exaggeration at a later developmental stage is at this stage a more serious offence than a lie which is closer to the truth or reality (i.e. it could happen, it could be so). Therefore, in the aforementioned moral stories, the boy who told his mother he had seen a dog as big as a cow is deemed 'more disobedient' ('worse'), because no dog could ever be as big as a cow and *'no one would ever believe it'* (Piaget, 1977, p. 144).



In a contribution analysing research studies inspired by Piaget's work, Lickona provides three basic factors which Piaget uses as conditions for changing into a higher – and therefore more autonomous – form of morality.

- *the necessary degree of intellectual development,*
- *experience with socially equal peer relationships,*
- *independence of the limited pressure of adult authority* (Lickona, 1976, p. 229).

Piaget puts the highest emphasis on the second factor and explicitly says: '*Good is a product of co-operation*' (Piaget, 1977, p. 188). By combining the first and the second thesis, Piaget comes to a fundamental conclusion: *Autonomous (independent) understanding of the rules develops through children's co-operative interaction.*

An overview of the attributes of heteronomous and autonomous morality (Hogan, Emler, 1978, p. 213; Vacek, 1992, pp. 92–93)

Heteronomous morality

- is based on relationships of pressure (external pressure of authorities)
- rules are viewed as unchangeable requirements coming from an outside authority and should be obeyed to the letter
- incorrect conduct is judged according to external attributes and behaviour consequences ('degree of damage')
- punishments are generally

Autonomous morality

- is based on relationships of co-operation, mutual understanding and equal rights
- rules are viewed as a product of mutual agreement and are open to discussion ('negotiation')
- incorrect conduct is judged in relation to the original intention of the actor
- punishment is defined according to



understood as correct and are decided the offence and the original intention by an authority; they are the and is understood as a means of automatic consequences of an fulfilling the intentions (ideals) of offence; punishment is an inherent humanity part of justice (law)

6.3 Bull's Concept of Moral Development

In his publication entitled *Moral Education* (1973), Norman Bull, on the basis of empirical findings, divides moral development into four stages: *pre-moral (anomy)*, *external (heteronomy)*, *internally external (externally internal) (socioonomy)*, and *internal (autonomy)*.

He illustrates these stages using driving a car as an example. At the lowest, *pre-moral* level, an individual drives a car without any consideration for other people. He/she only regards his/her own benefit and has only one worry: to not cause damage to him/herself. His/her moral dimension lies in evoking pleasure and avoiding unpleasantness or damage to him/herself. This is a decidedly egotistical stage.

In the second stage of development, an individual can drive carefully, but only does so for fear of the law (the rules of the road) and the consequences stemming from breaching them. Here, the regulating mechanisms are reward and punishment. This is a case of *external* morality.

In the third, higher stage (*externally internal* stage of moral development), an individual also drives carefully, but his/her main motivation is the protection of other people and his/her own reputation in their eyes. In this stage, the norms are social reward or social rejection (guilt, shame, ruining one's good name).

At the highest level of so-called *internal* morality, an individual drives with consideration, as he/she is led to such conduct by internal (internalised, interiorised) moral principles. In this case, the regulating mechanisms are the



awareness of one's worth (self-respect) and self-control based on conscience (Bull, 1973, pp. 3–4; Vacek, 1996, p. 15).

In this context, Nakonečný cites Staub:

The concept of internalisation is used to explain how an individual becomes the master of his/her own moral conduct; this occurs as a result of his/her acceptance of the moral values of his/her society as his/her own and obedience to these values in his/her own conduct. (Nakonečný, 2009, p. 231)

6.4 Kohlberg's Stages of Moral Development

Lawrence Kohlberg distinguished three levels of moral development and divided each of them into two stages:

Level 1 – Pre-conventional (stages 1 and 2),

Level 2 – Conventional (stages 3 and 4),

Level 3 – Post-conventional (stages 5 and 6).

Kohlberg describes the individual levels in the following manner:

The pre-conventional level is the level of the majority of children up to the age of nine, some adolescents, and many adolescent and adult criminals. The conventional level is the level of the majority of adolescents and adults in our society and other societies. The post-conventional level is achieved by a minority of adults – the most morally advanced – and only appears after an individual's 20th year of age. (Kohlberg, 1976, p. 33)

We should add that this minority of the most morally advanced amounts to roughly one-fifth of the population, according to Kohlberg and his colleagues.

I. Pre-conventional level:

The sensitivity of reactions to social moral norms is given by the significance (in the eyes of the child) of the carriers of these norms and also by the physical and hedonistic consequences which the child's conduct brings.

Stage 1: Heteronomous morality (obedience- and punishment-driven).

What is right? To avoid such conduct that is punished, obedience for obedience's sake, obedience to authorities as carriers and requestors of



adherence to norms. Fear of punishment is the main motive for adherence to rules and norms.

Commentary: The egocentric view dominates; the child is not aware of the interests of others or that others are different. He/she cannot adopt the perspective of another person (decentration). He/she identifies his/her perspective with the authority's perspective. It is important to respect authority not because it represents the social order or moral ideals, but because it is stronger. Heidbrink points out that at this stage, morality is still strongly situation-bound. With each situation, one's ideas about what is correct and incorrect conduct change. If, contrary to convention, certain conduct remains unpunished or is even rewarded, it is no longer bad, but good in the eyes of the child (Heidbrink, 1997, p. 75).

Stage 2: Individualism, intentionality, reciprocity, striving for reward and appreciation.

What is right? Rules are obeyed when it serves the immediate interest of the individual; conduct is directed at satisfying self-interests and self-needs and at not preventing others from doing the same; the right thing is what is of advantage primarily to the person in question.

Commentary: The egocentric attitude remains, but elements of fairness and reciprocity begin to appear; however, they are always interpreted pragmatically according to the motto: *You scratch my back and I'll scratch yours*. Reciprocity is not built on loyalty, gratitude and general justice, but on 'advantageousness'. Successful ends can justify debatable means. The individual is aware that everybody follows their own interests and thus various interests can come into conflict; the law (truth) is therefore relative (in the concrete, individualistic sense). As Heidbrink mentions, a very strong and 'special' sense of justice is typical for this stage. He even speaks about a kind of 'egalitarian fanaticism' which is asserted without taking into account the circumstances, possibilities and intentions of the actors involved. This is why some older siblings



experience their parents' real or presumed favouritism of younger siblings as a great injustice (Heidbrink, 1997, pp. 76–77).

II. Conventional level:

The effort to fulfil the expectations of one's family and friends and to support obedience of laws that are considered valuable regardless of their immediate consequences and the wider context; an attitude of loyalty to social (interpersonal) expectations and social order.

Stage 3: Orientation towards mutual relationships, social accord and the social contract, and the stage of the good boy and the good girl.

What is right? To live according to the expectations of our loved ones and according to the expectations of other people in such rules as govern the conduct of son, brother, friend, etc. It is important 'to be good' and this means to have good motives and to show an interest in others. It also means maintaining (taking care of) mutual relationships based on trust, loyalty, respect and gratitude.

Commentary: The perspective of the individual is connected to the perspective of other people. It is considered natural to correct one's self-interest with regard to the interests of other people. When considering others, one often takes into account the intentions of the acting person; *'He/she means well'* becomes a common sentence. A person does not do many things, because he/she would 'lose face' as a result. Moral reasoning and conduct is driven by what would please others. *'Everyone would do that'* is a characteristic substantiation of conduct at this stage. Heidbrink says:

In fact, this stage is not characterised by a certain catalogue of virtues as much as it is by an orientation towards the norms of one or more interest groups that are important to the individual. These can include family, friends, acquaintances or colleagues, and it is also possible to change the interest group according to the situation. (Heidbrink, 1997, p. 78)



To be complete, we will add that this group, with which the young individual can unreservedly identify and be fully devoted to, can also be a low-quality group, even participating in antisocial activities (often socially provocative group non-conformity towards the outside – against the majority ‘adult’ society – is combined here with the absolute, blind conformity of the members to their group, i.e. to the inside).

Stage 4: Orientation towards respecting the social system, order and laws.

What is right? Proper conduct means doing one’s duty, showing respect for authority, and supporting the functioning order of the society as a whole. Social authorities (directors, presidents, teachers, etc.) must be respected in order to support the maintenance of the social order. Adherence to laws, norms and rules has a wider social validity; it enables us to distinguish the good from the bad. It is of essential importance to avoid breaching the community order ‘from the inside’ by breaching norms (‘*What if everybody did that?*’).

Commentary: An authority shielded by norms (laws, regulations) must be accepted. A law is respected as it is the law; a regulation is respected for its very existence. Rules and norms are understood as static, and exceptions to the rules cannot be tolerated. Should there be a clash between an ‘order’ from the conscience and a codified social norm, preference is given to the norm. Under certain circumstances, this can be a serious problem because it is as if we were left ‘at the mercy’ of norms and laws with varying levels of quality. In extreme cases, especially in dictatorial societies, laws and regulations that are inhuman, e.g. those which codify racial, ethnic or religious hatred, become the official norms. Both the past and the present contain numerous warnings in this regard. However, at this stage and at the previous stage the process of the gradual internalisation of norms is underway.

III. Post-conventional level (also called the principal level):

At this level there is an obvious effort to define moral values and principles that are applied regardless of the influence of a group’s or an individual’s authority



and also regardless of one's personal, individual identification with these groups.

Stage 5: Orientation towards the legal social contract and respect of an individual's rights.

What is right? To be aware of the fact that people have a wide range of various values and attitudes and that the majority of these values and norms are related to the majority of human communities. There are relative norms whose existence is subject to a social contract. Apart from these, there are values (the right to live, the freedom of the individual, etc.) which form a permanent basis of interpersonal co-existence and must be respected in any society, regardless of the opinion of the majority. One has to ensure that laws and norms are built on the rational consideration of general benefit: *'What is the greatest good for as many people as possible?'*

Commentary: Correct conduct stems from respecting individual rights that are agreed by the entire society. An emphasis is put both on the maintenance of the legal social contract and on the possibility of making rational and socially desirable changes in the law (norms) through legal and democratic negotiations. When solving conflicts, legal procedures based on approved norms are preferred. Within such a framework, societies should function that are built and developed according to the principles of parliamentary democracy.

Stage 6: Orientation towards universal ethical principles.

What is right? To obey one's own freely chosen moral principles. Common democratic laws and social contracts are primarily based on these principles (or stem from them). If the norms of a given community are in contradiction to these principles, an individual at the sixth stage of moral development acts in accordance with his/her own principles. The basic universal principles include the principle of human equality, respect for human dignity and individual freedoms, freedom of speech and religion, etc. Therefore, this means rational and emotional acceptance of knowledge of the highest value of universal moral



principles and acceptance of a personal commitment to think and act in accordance with them. One's own conscience is the criterion for moral judgement.

Commentary: Laws are defined by an individual's conscience and are in accordance with the chosen principles. These are created and adopted on the basis of deep understanding (thought analysis), universality, and the social contract. These ethical principles are abstract (e.g. Kant's categorical imperative). Therefore, these are not particular moral rules such as the Ten Commandments. In essence, these are principles of justice, mutuality and equality, and respect for the dignity of human beings as individual personalities. Universal moral principles can become a norm of a higher value than obeying the law (for more, see Vacek, 2013).

Kohlberg derived the above-analysed stages of moral development from empirical longitudinal research studies in the United States (Kohlberg, 1963). His stage-oriented theory was later verified – critically and through research – by Kohlberg and his colleagues as well as by many other psychologists and educators.

The interview method which he created and further elaborated was based on the presentation of a moral situation (a moral dilemma) and on the subsequent questioning of the research subject. The questioning should lead to a determination of the reasons for the subject to resolve the submitted problem in a particular way and thus to determine the level of his/her moral reasoning. As a tool to identify moral maturity, Kohlberg developed a set of stories in which a person (persons) appear(s) to be in a moral dilemma. The best-known example is Heinz's dilemma:

A woman was near death from a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging ten times what the drug cost him to



produce. He paid \$400 for the radium and charged \$4,000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about \$2,000, which is half of what it cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said: 'No, I discovered the drug and I'm going to make money from it.' So Heinz got desperate and broke into the man's store to steal the drug for his wife. (Kohlberg, 1984, p. 640)

Example questions following Heinz's dilemma:

Should Heinz have stolen the drug for his wife? Why or why not? Is it good or bad, from his point of view, to steal the drug? Why is it good or why is it bad? Does Heinz have a commitment or even a duty to steal the drug? Why or why not?

*If Heinz did not love his wife, should he also have stolen the drug for her? (If the subject believes that Heinz should not have stolen the drug, then the question is: *Is there a difference in what Heinz should do if he loved or did not love his wife?*) Why or why not?*

*Let us assume that the dying person is not his wife, but a stranger. Should Heinz have stolen the drug for a stranger? Why or why not? (Should the subject support the theft of the drug for a stranger, he/she is offered these questions: *Let us imagine that this is some pet that Heinz loves. Should Heinz steal to save it? Why or why not?*)*

Is it important for people to do everything possible to save another person's life? Why or why not? To steal means to act in contradiction of the law for Heinz. Is his act morally wrong? Why or why not?

Generally speaking, should people try to do everything possible to surrender to the law (to obey the law)? Why or why not? How should this be applied to what Heinz should do?



When you think about Heinz's dilemma, what conduct would you consider to be a manifestation of his highest possible responsibility? Why? (Kohlberg, 1984, pp. 640–641; Colby and Kohlberg, 1987, p. 230)

You can find more about Kohlberg's theory of moral development in Heidbrink (1997) and Vacek (1992, 2002 and 2013).

● Practical Application of the Subject – Tasks and Activities

Provide examples of the most frequent rule breaches and consider their seriousness.

Provide reasons for the immorality of cheating in school. How should one approach this problem? Use your experience as pupils and students.

Find out how people in your social environment understand (accept) Václav Havel's famous sentence: 'Truth and love will prevail over lies and hatred.'

In *Psychologie morálky a výchova charakteru žáků* (P. Vacek), Appendix 4, pp. XIII and XIV, look up the story *Prodej hamburgerů* (Hamburger Sales) and analyse the conduct of the individual characters in the story.

Explain the term 'white lie' and provide examples based on your own experience.

● Review Questions

Characterise the basic differences between heteronomous morality and autonomous morality.

What is the essence of autonomy in moral development?

Describe the changes that occur in childhood in terms of relationships with rules.

Explain the term 'interiorisation of rules'.

Characterise the individual stages of moral development according to Kohlberg.



● Summary

Moral development in ontogenesis is describable and recognisable especially during childhood and adolescence, similarly to cognitive development. Jean Piaget and Lawrence Kohlberg are deservedly considered to be the founders of moral psychology as a relatively young psychological discipline. Piaget's distinguishing between heteronomous morality and autonomous morality based on analysing the development of a child's inference with regard to his/her relationship with rules enables one to identify the transition stage of moral reasoning, from being dependent on authorities to the model in which the child's inference becomes independent through the interiorisation of rules. Rule interiorisation also becomes of central importance to Norman Bull in his concept of the process of moving from external morality to internal morality.

Kohlberg built on Piaget's work by elaborating his theory in stages in which he defined three levels and six stages of moral development. The pre-conventional level is associated with the first egotistic and the second 'reciprocal' stage of moral development. The third stage of sociometry (the good boy/good girl stage) and the fourth stage oriented towards respecting law, order and rules are part of the conventional level. At the post-conventional level of moral development, Kohlberg distinguished the fifth stage on the principle of the social contract (rules and norms can be changed after mutual agreement for the benefit of as many people of a given community as possible) and the sixth stage based on adopting as one's own the universal principles of humanity (freedom, equality, respect for the dignity of each individual, etc.) associated with an internal corrective device consisting of a developed conscience.

To determine the level of heteronomous or autonomous morality, Piaget uses pairs of moral stories and Kohlberg uses moral dilemmas.



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