Learning Process

PSY201

University of Ibadan Distance Learning Centre
Ibadan Open and Distance Learning Course Series Development

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Vice-Chancellor's Message

The Distance Learning Centre is building on a solid tradition of over two decades of service in the provision of External Studies Programme and now Distance Learning Education in Nigeria and beyond. The Distance Learning mode to which we are committed is providing access to many deserving Nigerians in having access to higher education especially those who by the nature of their engagement do not have the luxury of full time education. Recently, it is contributing in no small measure to providing places for teeming Nigerian youths who for one reason or the other could not get admission into the conventional universities.

These course materials have been written by writers specially trained in ODL course delivery. The writers have made great efforts to provide up to date information, knowledge and skills in the different disciplines and ensure that the materials are user-friendly.

In addition to provision of course materials in print and e-format, a lot of Information Technology input has also gone into the deployment of course materials. Most of them can be downloaded from the DLC website and are available in audio format which you can also download into your mobile phones, IPod, MP3 among other devices to allow you listen to the audio study sessions. Some of the study session materials have been scripted and are being broadcast on the university's Diamond Radio FM 101.1, while others have been delivered and captured in audio-visual format in a classroom environment for use by our students. Detailed information on availability and access is available on the website. We will continue in our efforts to provide and review course materials for our courses.

However, for you to take advantage of these formats, you will need to improve on your I.T. skills and develop requisite distance learning Culture. It is well known that, for efficient and effective provision of Distance learning education, availability of appropriate and relevant course materials is a *sine qua non*. So also, is the availability of multiple plat form for the convenience of our students. It is in fulfilment of this, that series of course materials are being written to enable our students study at their own pace and convenience.

It is our hope that you will put these course materials to the best use.

Prof. Abel Idowu Olayinka

Vice-Chancellor

Foreword

As part of its vision of providing education for "Liberty and Development" for Nigerians and the International Community, the University of Ibadan, Distance Learning Centre has recently embarked on a vigorous repositioning agenda which aimed at embracing a holistic and all encompassing approach to the delivery of its Open Distance Learning (ODL) programmes. Thus we are committed to global best practices in distance learning provision. Apart from providing an efficient administrative and academic support for our students, we are committed to providing educational resource materials for the use of our students. We are convinced that, without an up-to-date, learner-friendly and distance learning compliant course materials, there cannot be any basis to lay claim to being a provider of distance learning education. Indeed, availability of appropriate course materials in multiple formats is the hub of any distance learning provision worldwide.

In view of the above, we are vigorously pursuing as a matter of priority, the provision of credible, learner-friendly and interactive course materials for all our courses. We commissioned the authoring of, and review of course materials to teams of experts and their outputs were subjected to rigorous peer review to ensure standard. The approach not only emphasizes cognitive knowledge, but also skills and humane values which are at the core of education, even in an ICT age.

The development of the materials which is on-going also had input from experienced editors and illustrators who have ensured that they are accurate, current and learner-friendly. They are specially written with distance learners in mind. This is very important because, distance learning involves non-residential students who can often feel isolated from the community of learners.

It is important to note that, for a distance learner to excel there is the need to source and read relevant materials apart from this course material. Therefore, adequate supplementary reading materials as well as other information sources are suggested in the course materials.

Apart from the responsibility for you to read this course material with others, you are also advised to seek assistance from your course facilitators especially academic advisors during your study even before the interactive session which is by design for revision. Your academic advisors will assist you using convenient technology including Google Hang Out, You Tube, Talk Fusion, etc. but you have to take advantage of these. It is also going to be of immense advantage if you complete assignments as at when due so as to have necessary feedbacks as a guide.

The implication of the above is that, a distance learner has a responsibility to develop requisite distance learning culture which includes diligent and disciplined self-study, seeking available administrative and academic support and acquisition of basic information technology skills. This is why you are encouraged to develop your computer skills by availing yourself the opportunity of training that the Centre's provide and put these into use.

In conclusion, it is envisaged that the course materials would also be useful for the regular students of tertiary institutions in Nigeria who are faced with a dearth of high quality textbooks. We are therefore, delighted to present these titles to both our distance learning students and the university's regular students. We are confident that the materials will be an invaluable resource to all.

We would like to thank all our authors, reviewers and production staff for the high quality of work.

Best wishes.

Professor Bayo Okunade

Director

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About this course manual

Learning Process PSY201 has been produced by University of Ibadan Distance Learning Centre. It is structured in the same way, as other psychology course.

How this course manual is structured

The course overview

The course overview gives you a general introduction to the course. Information contained in the course overview will help you determine:

- If the course is suitable for you.
- What you will already need to know.
- What you can expect from the course.
- How much time you will need to invest to complete the course.

The overview also provides guidance on:

- Study skills.
- Where to get help.
- Course assessments and assignments.
- Activity icons.
- Study sessions.

We strongly recommend that you read the overview *carefully* before starting your study.

The course content

The course is broken down into study sessions. Each study session comprises:

- An introduction to the study session content.
- Learning outcomes.
- Content of study sessions.
- A study session summary.
- Assessments and/or assignment, as applicable.

Your comments

After completing this course, Learning Process, we would appreciate it if you would take a few moments to give us your feedback on any aspect of this course. Your feedback might include comments on:

- Course content and structure.
- Course reading materials and resources.
- Course assessments.
- Course assignments.
- Course duration.
- Course support (assigned tutors, technical help, etc).
- Your general experience with the course provision as a distance learning student.

Your constructive feedback will help us to improve and enhance this course.

Course overview

Welcome to Learning Process PSY201

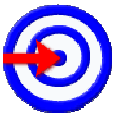
Understanding the learning process is a key element that provides a framework for trainers to plan, create and deliver effective lessons, and assesses client's learning. In this open and distance learning course, you will be introduced to the learning process. The course will provide a basic introduction to behavioural psychology, covering such topics as classical conditioning, operant conditioning, social learning, animal learning and motivation, and behaviour modification. The principles of learning theories and their application to the control and modification of human behaviour are also examined.

This course manual supplements and complements PSY201 UI Mobile Class Activities as an online course. You may use this platform to interact with your tutor and submit your assignments, receive tutor feedback and course news with updates.

Learning ProcessPSY201—is this course for you?

PSY201 is a three unit required course. It offers you an engaging introduction to experimental analysis of learning process in animals and man. Throughout this study, you will gain insight into the how learning is constructed, as well as explore current theories and issues in areas such as cognition, motivation, and thinking. The importance of scientific methods and principles of research design is emphasized throughout this course and presented in a way that will enrich your study of individuals as thinking and social beings.

Course outcomes



Outcomes

Upon a successful completion of Learning Process PSY201, you will be able to:

- *analyse* how learning is acquired.
- *point out* how at least four theories of learning exemplify the learning process from different perspectives.
- *Discuss* the implications of learning theories to human learning.

Timeframe

How long?

This is a one semester course.

45 hours of formal study time is required.

Study skills

As an adult learner your approach to learning will be different to that from your school days: you will choose what you want to study, you will have professional and/or personal motivation for doing so and you will most likely be fitting your study activities around other professional or domestic responsibilities.

Essentially you will be taking control of your learning environment. As a consequence, you will need to consider performance issues related to time management, goal setting, etc. Perhaps you will also need to reacquaint yourself in areas such as essay planning, coping with exams and using the web as a learning resource. Your most significant considerations will be *time* and *space* i.e. the time you dedicate to your learning and the environment in which you engage in that learning.

We recommend that you take time now—before starting your self-study—to familiarize yourself with these issues. There are a number of excellent web links & resources on the Course Site. Go to “Self-Study Skills” menu on the course site.

Need help?

Help

As earlier noted, this course manual complements and supplements PSY201at UI Mobile Class as an online course.

You may contact any of the following units for information, learning resources and library services.

Distance Learning Centre (DLC)
University of Ibadan, Nigeria
Tel: (+234) 08077593551 – 55
(Student Support Officers)
Email: ssu@dlc.ui.edu.ng

Head Office
Morohundiya Complex, Ibadan-Ilorin Expressway, Idi-Ose, Ibadan.

Information Centre
20 Awolowo Road, Bodija,
Ibadan.

For technical issues (computer problems, web access, and etcetera), please send mail to webmaster@dlc.ui.edu.ng.

Academic Support

Help

A course facilitator is commissioned for this course. You have also been assigned an academic advisor to provide learning support. The contacts of your course facilitator and academic advisor for this course are available at onlineacademicsupport@dlc.ui.edu.ng

Activities

Activities

This manual features "Activities," which may present material that is NOT extensively covered in the Study Sessions. When completing these activities, you will demonstrate your understanding of basic material (by answering questions) before you learn more advanced concepts. You will be provided with answers to every activity question. Therefore, your emphasis when working the activities should be on understanding your answers. It is more important that you understand why every answer is correct.

Assessments

Assessments

There are three basic forms of assessment in this course: in-text questions (ITQs) and self assessment questions (SAQs), and tutor marked assessment (TMAs). This manual is essentially filled with ITQs and SAQs. Feedbacks to the ITQs are placed immediately after the questions, while the feedbacks to SAQs are at the back of manual. You will receive your TMAs as part of online class activities at the UI Mobile Class. Feedbacks to TMAs will be provided by your tutor in not more than 2 weeks expected duration.
Schedule dates for submitting assignments and engaging in course / class activities is available on the course website. Kindly visit your course website often for updates.

Bibliography

Readings

For those interested in learning more on this subject, we provide you with a list of additional resources at the end of this course manual; these may be books, articles or websites.

Getting around this course manual

Margin icons

While working through this course manual you will notice the frequent use of margin icons. These icons serve to "signpost" a particular piece of text, a new task or change in activity; they have been included to help you to find your way around this course manual.

A complete icon set is shown below. We suggest that you familiarize yourself with the icons and their meaning before starting your study.

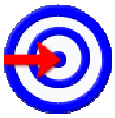
 **Activity**	 **Assessment**	 **Assignment**	 **Case study**
 **Discussion**	 **Group Activity**	 **Help**	 **Outcomes**
 **Note**	 **Reflection**	 **Reading**	 **Study skills**
 **Summary**	 **Terminology**	 **Time**	 **Tip**

Study Session 1

Concepts of Learning

Introduction

Learning pervades our lives. It involves not only the mastering of a new skill or academic excellence but also emotional and moral development. We learn what or who to fear, who to love, how to be polite, how to be law abiding, how to live in a group, and so on. Given the pervasiveness of learning in our lives, we will be exploring many instances of learning in this Study Session.



Learning Outcomes

When you have studied this session, you should be able to:

i. *analyse* how learning is acquired.
ii. *discuss* different types of learning.
iii. *exemplify* learning process from different perspectives.

1.1 Acquisition of Learning

Learning A relatively lasting change in behaviour that is the result of experience.

Behaviour Manner of behaving or conducting oneself

Learning is a relatively permanent change in **behaviour**. It reflects a gain of knowledge, understanding or skill, acquired or achieved through experience, which may include study, instruction, observation, or practice. Changes in behaviour are reasonably objective and, therefore, can be measured.

This definition specifically excludes any ability or skill that is attained by maturation, the process by which biologically predetermined patterns of behaviour unfold, more or less on schedule (for example). The definition also excludes reflexes, since they are innate, involuntary response to

stimulation rather than relatively permanent change of behaviour brought about by experience. Nor does learning include temporarily induced states, which are brought about by physiological factors, such as illness medication, or fatigue. For example, if a student performs much better on a test in Psychology 201 this week than he/she did last week, it may not be because he/she has actually learned in the meantime. The student's first performance may not have been as good as it should have been because the student was tired or he/she not feel did well. Similarly, if the second performance of the student is much worse, the explanation may again be fatigue or poor health rather than that the student has forgotten something he/she has already learned.

Learning is generally defined as a relatively permanent change in behaviour or potential behaviour that results from direct or indirect experience, as stated by Adebayo in (Hulse, Deese and Egeth, 1990). For instance, Okoye (1983) defines learning as a relatively permanent change in behaviour of an organism arising from experience, while Burns (1995) conceives learning as a relatively permanent change in behaviour including observable activities and internal process, such as thinking, attitude and emotions. These definitions suggest that, in the first instance, learning includes the concept of motivation and that learning might not manifest itself in observable behaviour until sometime after the education programme has taken place.

In addition, learning must change the individual in some ways. First, learning is assumed to have taken place, if the learner can relatively learn simple task, such as opening a door; or at a complex level, solving Algebra or operating computer programming. Whether the learning process is simple or complex, the fact remains that the individual must be different from what he/she was before the learning process took place. Thirdly, this change is about as a result of experience and practice.

According to Adebayo (1999, 2005), defining learning as a relatively permanent change has been criticized on the basis of how persistent a potential change in behaviour ought to be in order to qualify as a "relatively permanent change". While it may be accepted that a change in behaviour may persist for months, years or even decades, there are others that may not persist for more than a few minutes or seconds as in the short-term memory. From a different perspective, Walker's (1995) position appeared to be more appealing. Walker defined learning "as a potential change in behaviour resulting from experience, and the process has to do with encoding the message and interpreting the message correctly. The content of this definition, which centres on potential change of the learner's behaviour, only covers those situations in which learning occurs at a particular period, but does not manifest in behaviour. It is not observable until a future occurrence. For instance, when a coach is training a team of footballers for a competition, the training does not become manifest until the team secures a victory in terms outscoring its opponent. At the end of the match, one then can conclude the efficacy of the training programme.

If you pick up a standard psychology textbook – especially from the 1960s to 1970s, you will probably find learning defined as a change in behaviour. In other words, learning is approached as an outcome – the

product of some process. Thus, it can be recognized or seen. This approach has the virtue of highlighting a crucial aspect of learning – change. This becomes apparent when one is conducting experiments. However, it is rather a blunt instrument. For example:

1. Does a person need to perform in order for learning to have taken place?
2. Are there other factors that may cause behaviour to change?
3. Can the change involved include the potential for change? (Merriam and Caffarella, 1991: 124)

Questions such as these have led to qualification. Some have looked into the subject of identifying relatively permanent changes in behaviour (or potential for change) as a result of experiences (see behaviourism below). However, not all changes in behaviour resulting from experience involve learning. It would seem fair to expect that if we are to say that learning has taken place, experience should have been used in some ways. Conditioning may result in a change in behaviour, but the change may not involve drawing upon experience to generate new knowledge. Not surprisingly, therefore, many theorists have been less concerned with overt behaviour but with changes in the ways in which people 'understand, or experience, or conceptualize the world around them' (Ramsden, 1992:4) (see cognitivism below). The focus for them is gaining knowledge or ability through the use of experience.

The depth or nature of the changes involved is likely to be different. Some years ago, Saljo (1979) carried out a simple, but very useful piece of research. He asked a number of adult students what they understood by learning. Their responses fell into five main categories.

1. Learning as a quantitative increase in knowledge. Learning is acquiring information or 'knowing lot'.
2. Learning as memorizing. Learning is storing information that can be reproduced.
3. Learning as acquiring facts, skills, and methods that can be retained and used when necessary.
4. Learning as making sense or abstracting meaning. Learning involves relating parts of the subject matter to each other and to the real world.
5. Learning as interpreting and understanding reality in a different way. Learning involves comprehending the world by re-interpreting knowledge (quoted in Ramsden, 1992:26).

As Paul Rams Denx comments, we can see immediately that conceptions 4 and 5 are qualitatively different from the first three. Conceptions 1 to 3 imply a less complex view of learning. Learning is something external to the learner. It may even be something that just happens or is done to you by teachers (as in conception 1). In a way, learning becomes a bit like shopping. People go out and buy knowledge – it becomes their possession. The last two conceptions look to the 'internal' or personal aspect of learning. Learning is seen as something that you do in order to understand the real world.

1.1.1‘Knowing That’ and ‘Knowing How’

A man knowing little or nothing of medical science could not be a good surgeon, but excellence at surgery is not the same thing as knowledge of medical science; not is it a simple product of it. The surgeon must indeed have learned from instruction, or by his own inductions and observations, a great number of truths, but he must also have learned by practice a great number of aptitudes. (Ryle 1949:48-49).

Learning how or improving ability is not like learning that or acquiring information. Truths can be imparted, procedures can only be inculcated, and while inculcation is a gradual process, imparting is relatively sudden. It makes sense to ask at what moment someone became appraised of a truth, but not to ask at what moment someone acquired a skill (Ryle 1949:58).

In some ways, the difference here involves what Gilbert Ryle (1949) has termed ‘knowing that’ and ‘knowing how’. The first two categories mostly involve ‘knowing that’. As we move through the third category, we see that alongside ‘knowing that’ there is growing emphasis on ‘knowing how’. This system of categories is hierarchical – each higher conception implies all the rest beneath it. In other words, students who conceive of learning as understanding reality are also able to see it as increasing their knowledge’ (Ramsden, 1992:27).

ITQ

- How would you contrast ‘knowing that’ from ‘knowing how’ as elements to learning?
- ‘Knowing that’ is an immediate process that involves acquiring new information. On the other hand, ‘knowing how’ is a gradual process that involves long-term inculcation of knowledge.

1.1.2 Learning as a Process

In the five categories that Saljo identified, we can see learning appearing as a process – there is a concern with what happens when the learning takes place. In this way, learning could be thought of as ‘a process by which behaviour changes as a result of experience’ (Maples and Webster 1980, quoted in Merriam an Caffarella 1991:124). One of the significant questions that arise is the extent to which people are conscious of what is going on. Are they aware that they are engaged in learning – and what significance does it have if they are? Such questions have appeared in various guises over the years – and have surfaced, for example, in debates over the rather confusing notion of ‘informal learning’.

One particularly helpful way of approaching the area has been formulated by Alan Rogers (2003). Drawing especially on the work of those who study the learning of language (for example, Krashen 1982), Rogers’s uses two contrasting approaches: task-conscious or acquisition learning and learning-conscious or formalized learning.

Task-Conscious or Acquisition Learning

Acquisition learning is seen as going on all the time. It is concerned with the immediate and confined to a specific activity; it is not concerned with

general principles' (Rogers, 2003). Examples of this approach include much of the learning involved in parenting or with running a home. Some refer to this kind of learning as unconscious or implicit. Rogers (2003:21), however, suggests that it might be better to speak of it as having a consciousness of the task. In other words, whilst the learner may not be conscious of learning, they are usually aware of the specific task in hand.

Learning-Conscious or Formalized Learning

Formalized learning arises from the process of facilitating learning. It is 'educative learning' rather than the accumulation of experience. To this extent, there is a consciousness of learning – people are aware that the task they are engaged in entails learning. 'Learning itself is the task. What formalized learning does is to make learning more conscious in order to enhance it' (Rogers 2003:27). It involves guided episodes of learning.

When approached in this way, it becomes clear that these contrasting ways of learning can appear in the same context. Both are present in schools. Both are present in families. It is possible to think of the mix acquisition and formalized learning as forming a continuum.

Hint

At one extreme lie those unintentional and usually accidental learning events which occur continuously as we walk through life. Next comes incidental learning – unconscious learning through acquisition methods which occur in the course of some other activity. Then there are various activities in which we are somewhat more conscious of learning, experiential activities arising from immediate life-related concerns, though even here the focus is still on the task. Then come more purposeful activities- occasions where we set out to learn something in a more systematic way, using whatever comes to hand for that purpose, but often deliberately disregarding engagement with teachers and formal institutions of learning. Further along the continuum lie the self-directed learning projects on which there is so much literature. More formalized and generalized (and consequently less contextualized) forms of learning are the distance and open education programmes, where some elements of acquisition learning are often built into the designed learning programme. Towards the further extreme lie more formalized learning programmes of highly decontextualized learning, using material common to all the learners without paying any regard to their individual preferences, agendas or needs. There are of course no clear boundaries between each of these categories (Rogers, 2003:41-2)

ITQ

- Why would you not necessarily classify innate response to stimuli as a form of learning?
- There is some form of consciousness usually associated with learning. Innate responses are involuntary natural responses.

1.2 Types of Learning

There are various ways in which learning could be acquired. In this section, various types of learning methods would be discussed. The types of learning to be discussed are as follows: verbal learning, motor learning, concept learning, problem solving, serial learning and paired association learning.

Learning, defined as a process of bringing relatively permanent changes in the behaviour of an organism, may be classified in a number of ways depending upon the domain or specific area of the behaviour in which changes are introduced or in terms of the methods or techniques that are employed for the introduction of behavioural changes.

If we follow the former criterion, then learning can be classified as verbal learning (involving verbal expression), learning of motor skills (such as walking, dancing, typing, swimming, etc), affective learning (learning of habits, interest attitudes, appreciation, etc) and cognitive learning (learning of concepts, principles, problem-solving etc).

In the case of the latter criterion, we may categorize learning as trial and error learning, classical conditioning, operant conditioning, chain learning, shaping, learning through generalization, learning through discrimination, serial learning, association learning, insightful learning, etc.

An alternative basis adopted by Gagne (1970) for the purpose of classifying learning is worthy of examination. By taking into consideration, a specific hierarchical order, Gagne (1970) has classified learning into eight types; namely, signal learning (classical conditioning), S. R. learning (instrumental and operant conditioning), chain learning, verbal associate learning, multiple discrimination, learning of concepts, multiple discrimination, learning of principles and problem-solving.

Many of these various types of learning are discussed somewhere in this text. However, a few are discussed below.

1.2.1 Verbal Learning

Learning of this type helps in the acquisition of verbal behaviour. The languages we speak, the communication devices we use, are the result of such learning. Rote learning and rote memorization which are a type of school learning are also included in verbal learning. Signs, pictures, symbols, words, figures, sounds and voices, etc., are employed by the individual as an essential instrument for engaging himself in the process of verbal learning.

1.2.2 Motor Learning

The learning of all types of motor skills may be included in such type of learning. Learning how to swim, riding a horse, driving a car, flying a plane, playing the piano, hitting a moving target, drawing a geometrical design, adding and multiplying long digits, performing experiments and handling various instruments are the examples of such learning. Acquisition of various skills through such learning helps in developing

speed and accuracy in the field of operation of these skills and creates a sort of confidence in the learner to perform any of the tasks with great ease and satisfaction. The art of these skills can be acquired through a systematic and planned way of fixation of a series of organized actions or responses by making use of some appropriate learning methods and devices.

1.2.3 Concept Learning

A concept is a form of mental image, which denotes a generalized idea about the things, persons or events. For example, our concept of "tree" is a mental image that brings to us the similarities or common properties of all the different trees we know. We normally call a thing tree when it has some specific characteristics, the image of which we have already acquired in our mind on account of our previous experience, perception or rich imagination. The formation of such concepts on account of previous experience, training or cognitive processes is called concept learning. Such type of concept learning proves very useful in recognizing, naming and identifying things. All of our behaviour, verbal, symbolic, motor as well as cognitive, is influenced by our concepts. Thus, what we do, say, understand, reason and judge is, to a great extent, controlled by the quality of our concept learning.

1.2.4 Problem Solving

In the ladder of learning and acquisition of behaviour, problem-solving denotes a higher type of learning. Such type of learning requires the use of the cognitive abilities like reasoning, thinking, power of observation, discrimination, generalization, imagination, ability to infer and draw conclusions, trying out novel ways and experimenting, etc. Based on the grounds of earlier experiences, effect of coaching, training, formal or informal learning and acquisition of knowledge, habits, attitudes, interests and learning sets, etc. An individual may be motivated to reach an unknown target or unfold the mystery of an unresolved problem. How he/she can be trained to accomplish such a task is the function of problem-solving. This type of learning has essentially caused human beings to contribute significantly to the progress and improvement of society.

In the process of acquiring the types of learning discussed so far, one has to adopt an adequate technique in the form of some methods or processes. In some cases, connections or associations in the form of stimulus-response mechanism, instrumental or conditioning method may help while in some others, organization of the perceptual field and the use of cognitive abilities may work. The use of special techniques, such as serial learning, associates learning, etc., developed by the psychologists may also help in this direction. Let us see what we mean by them.

ITQ

- Distinguish between the 'external' and 'internal' aspects to learning.
- As an 'external' process, learning is directed at the learner from the outside by a teacher, for example, to cause a change in behaviour. As an 'internal' process learning is more personal.

The process of change begins from the individual and is directed outside towards real world phenomenon.

1.2.5 Serial Learning

Serial learning consists of such learning in which the learner is presented with such type of learning material that exhibits some sequential or serial order. Children often encounter such a learning situation in schools where they are expected to master lists of material such as the alphabet, multiplication tables, the names of all the states in their country, the names of presidents or prime ministers in a specific order, etc. The experimental studies performed in the field of serial learning have shown that out of the serial learning material, the items presented at the beginning and the end of the list are easier to remember than those in the middle. The foregoing conclusion is correct whether the items are nonsense syllables, actual words or longer passages such as poems.

1.2.6 Paired Associates Learning

In this learning, learning tasks are presented in such a way that they may be learned on account of their associations. The name of a village like Kishanpur is remembered on account of its association with the name of Lord Krishna, or a girl's name, Ganga, by learning it in the form of making paired association with the river Ganges. Much of the verbal or motor learning may, thus, be learnt or remembered on account of the technique of paired or multiple association.

In the practice of such paired-associates learning, the learner may be presented with a series of paired words or nonsense syllables like the following:

Paired Words	Paired Nonsense Syllables
Dog – Animal	PN – PF
Parrot – Bird	NLP – JDS
Cat – Milk	RJBP – RNYS
Motor – Child	TIPBK – GMPRK

The learner views the pair (two words or syllables) for a brief spell, usually less than five seconds. He/she is then presented with one member of the pair and asked to recall the other. The practice with such method then helps in building what is known as associate learning. An example of paired associate learning is the acquisition of foreign language vocabulary items that are paired with their mother-tongue equivalents. The matching items presented in the objective type questions of the achievement test also lay emphasis on such type of learning.

ITQ

- Would you categorize learning a new language under acquisition or formalised learning? Justify your answer.
- Learning a new language can have elements of both but it involves a more conscious approach.

1.3 Theories of Orientation to Learning Process

A **theory** provides a general explanation for observations made over time, while a model is a mental picture that helps us understand something we cannot see or experience directly (Dorin, Demmin and Gabel, 1990). In general, theories are sets of statements, which make predictions about empirical events. There are a variety of theories or approaches to the study of learning that can be applied within educational contexts.

This section examines theories of orientations to learning process. Precisely, we will focus on the following five different theories/orientations.

1. the behaviourist orientation to learning;
2. the cognitive orientation to learning;
3. the social orientation;
4. the humanistic orientation; and
5. The development orientation to learning.

1.3.1 Behavioural Theory of Learning

Behaviourism is a theory of human and animal learning that focuses mainly on objective observable behaviours and discounts mental activities. Behavioural theorists see learning as a function of stimuli both within the individual and the environment. However, the theory concentrates on the study of overt behaviours that can be observed and measured (Good and Brophy, 1990) and ignores other abstractions, such as mood and thought processes occurring in the mind. The theory has influenced the concepts of learning greatly because of its simplicity. It has helped us to learn a great deal about our behaviours, the effect of our environment on us, how we learn new behaviour and what motivates us to change or remain the same. Behaviourism is often used by teachers, who reward or punish students' performances for effective learning process. There have been many criticisms of behaviourism, and this includes the fact that it does not account for some kinds of learning, since it disregards the activities of the mind. It does not also explain some forms of social behaviour, such as the recognition of new language patterns by young children for which there is not reinforcement mechanism. The key players in the development of the behaviourist school of thought were I. Pavlov, E. Thorndike, J. B. Watson and B. F. Skinner.

ITQ

- Point out the limitations of the behavioural theory of learning.
- Behavioural theory to learning has a narrow scope. It measures only behaviours that are observable while ignoring other important abstractions such as mood and thought processes occurring in the mind.

1.3.2 Social Approach to Learning

Humans and other animals often learn by simply observing others. For example, children learn by observing their parents. Albert Bandura

(1986) proposed social learning theory to account for such learning. Social learning has also been called observational learning, learning by modelling, learning by imitation and vicarious learning. No matter the emphasis or the label used, the central thrust of learning by modelling is that a person or animal observes the behaviour of another and from this observation, the person or animal is then able to perform some or all of that observed behaviour. Social learning theory suggests that the society plays a significant role in the way we think about ourselves and the world around us, and therefore how we interact or behave. This theory suggests that learners should have the opportunity to observe and model behaviour that leads to a positive reinforcement. They should also have the opportunity for collaborative learning since much of learning happens within important social and environmental contexts. Other key players in this school of thought were J. Rotter, and W. Mischel.

1.3.3 Cognitive Approach to Learning

In both classical and operant conditioning, the recognition and memory of association is the most important part of the learning process. The association may be between stimulus elements (classical) or between response and rewards or punishments (operant). Many learning researchers feel that, with humans, there is a lot more to learning than simple associations. They feel that there are cognitive or mental operations well beyond simple memory of associations that must be part of the learning process. They argue that the world is not made up of factual information but rather information that is always open to interpretation. Thus, cognitive psychology is the scientific study of mental activities in terms of information processing, such as reasoning, concept formation, attention, recognition, imagination and problem solving. This theory suggests that educators must be aware not only of what students learn, but also how they attempt to learn it. Teachers should also present information in organized sets and help learners see relationships that subsist among the sets. New information must be related to old ideas. Furthermore, students must be made to explore various possible response patterns and choose between them. They must also be made to direct their own learning. This school of thought is particularly associated with Bruner and Ausubel.

1.3.4 Developmental Theory of Learning

Swiss biologist and psychologist, Jean Piaget (1896-1980), is widely known for constructing a highly influential model of child development and learning, which combine cognitive and maturational variables. Piaget's model is based on the idea that the developing child builds cognitive structures – in other words, mental "map" schemes, or networked concepts for understanding and responding to physical experiences within his or her environment.

His view on how the mind of a child works and develops has been enormously influential, particularly, in educational theory. Piaget stated that a child's cognitive structure increases in sophistication with development, moving from a few innate reflexes, such as crying and sucking to highly complex mental activities. The concept of cognitive structure is central to his theory. Cognitive structures are patterns of

physical or mental action that underlie specific acts of intelligence and they correspond to stages of child development. There are mechanisms by which these cognitive structures grow in the course of the child's development. Atherton (2002) expatiated in the following ways on these mechanisms:

1. Adaptation refers to the process of adapting to the world through assimilation and accommodation.
2. Assimilation is the process by which a person takes new material into his/her mind from the environment. This may mean changing information already recorded in the brain. Thus assimilation is the normal process by which an individual integrates new data into previous learning. Piaget sees new perceptions as occurring within a lawful pre-existing framework. The child develops cognitive categories or mental pigeonholes in which to store new information. When new data do not fit into existing pigeonholes, new ones must be created.
3. Accommodation is the restructuring of the mind to accept new information. It is the process of altering the basic categories of thought, of modifying some activities because of environmental demands.
4. Classification refers to the ability to group objects together on the basis of common features.
5. Conservation is the realization that objects or sets of objects stay the same even when they are changed or made to look different.
6. Egocentrism is the belief that one is the center of the universe and everything revolves around one. Moving away from egocentrism is called decentration.
7. Operation is the process of working something out in one's head. Young children have to act and try things out in the real world. They count on their fingers, while older children and adults can do more in their heads.
8. Schema or scheme is a set of perceptions, ideas, or actions in the mind which go together.
9. Stage refers to a period in a child's development during which he or she is capable of understanding some things but not others.

ITQ

- Make a case for humanistic orientation as a theory of learning.
- Humanistic theory to learning presumes self-exploration as crucial to learning. There is an innate potential to learn.

Piaget's theory identifies four developmental stages and the processes through which children progress in the course of their growth. The four stages are:

1. **Sensori-motor Stage (from birth–2 years old).** Through physical interaction with his or her environment, the child builds a set of concepts about reality and how it works. The child's attention is centred on his or her body. At this stage, a child does not know that physical objects remain in existence even when out of sight (object permanence).

2. **Pre-operational Stage (2–7 years).** The child learns to use language and to represent objects by images and words. Thinking is still egocentric or irreversible. For example, a four-year old child is asked: "Do you have a brother?" He says 'yes', "What's his name?" He says 'No'. The child has difficult taking the viewpoint of others, but can classify objects by a single feature. For example, the child groups together all the red blocks regardless of shape, or all the square blocks no matter the colour.
3. **Concrete Operations Stage (7–9 years).** As physical experience accumulates, the child starts to conceptualise, creating logical structures that explain his or her physical experiences. He or she thinks logically about objects and events, achieves conservation of numbers, weight and mass. The child also classifies objects according to several features and can order them in a series along a single dimension, such as size. Abstract problem solving is also possible at this stage. For example, arithmetic equations can be solved with numbers not just with objects.
4. **Formal Operations Stage (11–15).** The final stage of logical development is that of formal operations. This involves the ability to use internalized abstract operations based on general principles to predict effects.

Tip

Educational Implication of Piaget's Theory

Piaget's theory has a number of implications for learning. Educators must plan a developmentally appropriate curriculum that enhances their students' logical and conceptual growth. Teachers must also emphasize the critical role that experiences or interactions with the surrounding environment play in student learning. For example, instructors have to take into account the role that fundamental concepts, such as the permanence of objects, play in establishing cognitive structures.

Discussion Activity 1.1

What constitutes learning?

Post your response on Study Session I forum page on course website.

Study Session Summary

Summary

This Study Session focused on learning process. We explored approaches to learning, types of learning. In this Study Session, we have noted that a theory provides a general explanation for observations made over time. We also discussed the behavioural approach to learning, cognitive approach, social approach, humanistic and developmental orientations to learning

Assessment

Assessment

SAQ 1.1

I. Briefly analyze the different schools of thought on learning as a process that brings change in behaviour.

SAQ 1.2

I. In your informed opinion how is learning by rote different from cramming?
II. How would you make a distinction between concept learning and paired associates learning?

SAQ 1.3

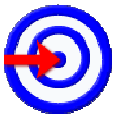
1. Explain the forms of adaptation in the developmental theory of learning.
2. Under the developmental theory of learning how is "classification" different from "conservation"?

Study Session 2

Classical Conditioning

Introduction

Many important scientific discoveries have been made by man quite accidentally, through careful observation or through plain curiosity. Classical conditioning is a good example. In this Study Session, we will examine classic studies, components and processes of classical conditioning, some recent developments and application of this form of learning to real life problems.



Learning Outcomes

When you have studied this session, you should be able to:

i. *discuss* studies on classical conditioning.
ii. *highlight* the components of classical conditioning.
iii. *present* the processes involved in classical conditioning.
iv. *point out* stimulus discrimination.
v. *discuss* the implications of Pavlov's theory to human learning.
vi. *present* the procedure for simultaneous conditioning.

2.1 Selected Studies in Classical Conditioning

2.1.1 Pavlov's Classical Conditioning Study

The name Ivan Pavlov usually rings a bell in the minds of behavioural scientists. He was not a psychologist, but a Russian physiologist who won the Noble Prize in 1904 for his work on animal digestion. Pavlov developed a method for measuring and analyzing the secretion of saliva.

He surgically implanted a tube in the salivary gland of a dog, then gave the dog meat powder (food). The meat powder caused the dog to produce saliva and Pavlov collected and measured it. Pavlov watched as the dogs went through his experiment procedures. After a while, Pavlov noticed that the dogs often salivated before the food was even placed in their mouths. Pavlov observed that this early salivation could be triggered or motivated by such things as the sight of the food, the click of the laboratory equipment or the sound of the experimenter's footsteps.

Pavlov taught dogs to salivate at the end of a bell. When meat powder (food) was placed on the dog's tongue, saliva would flow; this was a biological response requiring no learning. Pavlov then rang a bell before, placing the meat powder on the dog's tongue. This procedure was repeated a number of times, he rang the bell without supplying any food. The dog would salivate. The mere sound of the bell had led to the response; the association of the bell with the meat powder. Thus, Pavlov's experiment has produced some form of learning.

2.1.2 Watson's Behaviouralism

John B. Watson (1878-1958) introduced the term 'behaviourism' as a movement to re-define psychology as the study of observable behaviour instead of the science of introspection. To Watson, the reliance on internal mental process, which could not be objectively measured, was the chief reason that psychology lagged behind other sciences. Watson believed that the emotional reactions of love, fear and rage are part of the inherited nature of man and an obvious determinant of behaviour (Amsel, 1989). As Watson aged, his behaviourism became more radical (disbelieving cognitive or genetic "organism" processes in learning). His book on *Behaviourism* contains the following excerpt that reflects this position:

> "Give me a dozen healthy infants, well-formed, and my own special 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 and yes, even a beggar man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors. I am going beyond my facts and I admit it, but so have the advocates of the contrary and they have been doing it for thousands of years".

Watson demonstrated classical conditioning in an experiment involving a young boy (Albert) and a white rat. Originally, Albert was unafraid of the rat; but Watson created a sudden loud noise whenever Albert touched the rat. This made Albert afraid, and the fear was generalized to other small animals. Some accounts of the study suggest that the conditioned fear was more powerful and permanent than it really was (Samelson, 1980).

Watson formulated his view of learning in two laws. The Law of Frequency holds that the strength of a stimulus-response bond is determined by the number of pairings of an unconditioned and conditioned stimulus. The law of recency maintains that the response occurring nearest in time to the stimulus is most likely to be paired with it. Learning occurs because the unconditioned stimulus and conditioned stimulus occur closely and frequently.

2.2 Components of Classical Conditioning

What Pavlov observed in his experiment is called classical conditioning, or learning by association. It is essentially a matter of forming associations or relationship between objects or events in the external environment. To accomplish classical conditioning, I will present two events in such a way that you can form an association between them.

For instance, a woman leaves the hospital after recovering from a serious automobile accident. As she is about to enter the taxi that will take her home, she is overwhelmed with terror. In the same manner, an individual who lost his mother through an attack by a mentally deranged man will always dread the appearance of a mechanic.

Tip

*In either of these examples, a **stimulus** that would normally be of no special emotional significance (a taxi, or an attack) now comes to produce a powerful emotional **response** from the people involved.*

Presumably, the stimulus produces this response because of its past relation with other stimuli that were emotionally significant (accident or fetal attack). The study of Pavlovian conditioning is about stimulus-stimulus or (event-event) relations of this very type – about the conditions that produce association between stimuli, and about the behaviours these associations evoke.

Either of those instances of classical conditioning, like Pavlov's famous experiment, involves several important elements. The elements or components are as follows:

2.2.1 The Unconditioned Stimulus (UCS)

This is any stimulus that evokes a response without prior conditioning taking place – the meat powder (food) in Pavlov's experiment.

2.2.2 The Unconditioned Response (UCR)

This is the unlearned reaction to the UCS – salivation in the Pavlov experiment.

2.2.3 The Conditioned Stimulus (CS)

This is a previously neutral stimulus that comes, through association with UCS, to evoke a response similar to UCR – Pavlov's bell ringing. The conditioned response (CR) is the newly learned reaction to the CS – also salivation in Pavlov's experiment.

Table 2.1S-R items of Pavlov's experiment

Stimulus and Response Items of Pavlov's Experiment	
Food (meat Powder)	→Unconditioned Stimulus
Salivation	→ Unconditioned Response, natural, not learned
Bell	→ Conditioned Stimulus
Salivation	→ Conditioned Response

Hint

Classical conditioning is also known as Reflex, Respondent, or S – Type ("S" for stimulus) conditioning. It suggests that the learned response is elicited involuntarily from the subject rather than voluntarily produced by the subject.

Pavlov, the physiologist, envisioned that exposure to the unconditioned stimulus excited a neutral area in the brain's cortex that then triggered the unconditioned response in a reflexive (automatic) manner. Pavlov hypothesized that pairing the unconditioned stimulus with the conditioned stimulus formed a neutral link or bond between the two

stimulated areas, which when formed, would allow the unconditioned stimulus to directly evoke the conditioned response.

There are temporal arrangements of stimuli in classical conditioning:

In *short delay or standard conditioning*, the condition stimulus (Bell) is ringed shortly before the (UCS) presentation of the meat powder (food) (often about ½ second) and remains until the UCS starts.

In *delay conditioning*, what happens if the CS and UCS are quite long? In this procedure, the CS begins several seconds or more before the UCS and remains on until at least the outset of the UCS. For instance, in Pavlov's experiment, the bell was rang first before the sound went off, then the dog was presented with the powder meat (food). This method appears to be the best form of learning conditioning, involving a brief delay between CS and UCS (Heth and Rescorla, 1973; Solomon et al., 1993; Varlinskaya et al., 1997).

2.3 Classical Conditioning Processes

Classical conditioning involves several different processes. We will discuss five: acquisition, extinction, spontaneous recovery, stimulus generalization, and stimulus discrimination (figure 1 – 1).

2.3.1 Acquisition: Learning Something New

The initial process in classical conditioning is response acquisition. In Pavlov's view, it is the gradual formation of an association between the CS and the UCS, and it based on stimulus contiguity – the pairing of the stimuli in time – with the CR as a consequence (see Figure 1 – 1). How does acquisition occur? Let us take Pavlov's classical experiment as an example. At first, the bell (CS) is a neutral stimulus. If it is sounded before conditioning begins, it produces nothing more than an orienting reflex; the dog may prick up its ears and turn its head toward the source of the sound. During conditioning, the bell is followed shortly by the presentation of the meat powder (UCS), causing the dog to salivate (the unconditioned response). Acquisition consists of repeating this sequence of events a number of times. Each repetition is termed a trial. The dog soon salivates to the bell even when the bell is withheld (the CR).

A second example of acquisition is provided by both human and animal experiments in eyelid conditioning (Woodruff – Pak et al.,1997). The participants heard a tone, followed by a puff of air blown into the eye. The air puff caused an eye blink, and repeated pairing of the tone with the air puff caused the participants to blink at the sound of the tone. The tone is the CS; the air puff is the UCS; the eye blink to the air puff is the UCR; and the eye blink to the tone is the CR. The tone is a neutral stimulus that becomes a conditioned stimulus by pairing it with an unconditioned stimulus that elicits the reflexive eye blink response.

2.3.2 Extinction: Eliminating Learned Response

In Pavlov's experiment, a continued presentation of the CS without the UCS reduces and eventually eliminates the conditioned response (Ohman and Soares, 1993). This phenomenon is referred to as extinction – the reduction in responding that occurs whenever the CS is repeatedly

presented without the UCS. For example, in Pavlov's experiment, extinction occurs by repeatedly sounding the bell without presenting the meat powder. Eventually, the dogs stopped salivating at the sound of the bell, that is, the CR returns to its original preconditioning level. In another scenario, the college student who has a deathly fear of speaking in front of the groups will experience no reduction in that fear by simply avoiding a speech course.

Another Pavlov concept is stimulus generalization, the tendency to transfer the conditioned response to a stimulus that is similar but not identical to the one originally paired with the unconditioned stimulus. For example, a dog that has learned to salivate to one tone may also salivate to a tone slightly higher or lower in pitch, to a bell, or to some other sound.

2.4 Stimulus Discrimination

When stimulus generalization can be helpful, overgeneralization can be a problem. A dog conditioned to response to a specific tone might begin to salivate to the ringing of any door bell. Both concepts have practical implications. If we were not able to generalize learning from one stimulus to another, getting along in the world would be very difficult. We would have to learn how to respond separately to every single situation we confront. We would, for example, have to learn how to drive all over again every time we rent a different car, followed a new road, or were in a new driving situation. On the other hand, stimulus discrimination helps college students to learn with ease. For example, a college student is required to register for sixteen courses, each of which is three units in a session. In the course of attending his Study Sessions, the student is faced with the initial problem of overgeneralization of course titles. As the session goes on, the student initial problem is gradually solved because his ability to discriminate his course titles, with time, Study Sessions taking courses at intervals, and regular attendance in class will help to reduce overgeneralization.

2.5 Applications of Classical Conditioning

Classical conditioning is not merely a laboratory demonstration; it also affects important aspects of human life. It is involved in the learning of a wide range of normal behaviours and in helping smokers to stop smoking.

There are many examples of classically conditioned responses in humans. Perhaps you smile and feel happy upon seeing your significant others approaching and salivate at the sight of a banana fruit. Why do we have these reactions? The simple answer in each case is that we have formed a classically conditioned association between two stimuli, such that a previously neutral stimulus has come to elicit a reaction (sometime an emotional reaction) that is naturally or automatically produced by the unconditioned stimulus.

People who smoke are often encouraged to stop because it endangers their health. This procedure has also been used by Nigeria Tobacco Company; on every pack of cigarettes, there is bold inscription which

states that “smokers are liable to die young”. Some studies suggest that classical conditioning can help. One team of researchers had smokers inhale an extract of black pepper, then inhale smoke. They found that inhaling the pepper reduced the effects of nicotine withdrawal, when the smokers then stopped smoking. The black pepper provides sensory cues that serve RS CS’s for the physiological satisfaction response experienced by smokers. It relieves anxiety and produces sensations in the chest similar to those produced by smoking. As a result, the pepper may function as a substitute for the nicotine in cigarettes and help smokers to stop smoking (Rose and Belm, 1994). Classical conditioning has also been found useful among behaviour therapists – reducing irrational behaviour such as phobias.

Table 2.2 List of common phobias

Alektrophobia	Fear of Chicken
Androphobia	Fear of Men
Bibliophobia	Fear of Books
Coitophobia	Fear of Sexual Intercourse
Dysmorphobia	Fear of Minor body defects
Ecclesiaphobia	Fear of Churches
Phonophobia	Fear of Speaking
Xenophobia	Fear of Strangers

It is assumed that phobic reactions usually develop as a result of some adverse experiences with similar or related situations, in line with the principle of stimulus generalization. For example, strict discipline by a punitive father may lead to fear of all disciplinary figures.

Note

Spontaneous Recovery Experimental Extinction

This is usually temporary. The extinguished response returns after a period of rest. This is called spontaneous recovery. To achieve permanent extinction of a response, we have to keep on extinguishing it each time it returns. Spontaneous recovery was demonstrated when Pavlov extinguished his dog’s salivation to the bell and then waited for a few days before ringing the bell again and the dog’s salivation reappeared.

2.6 Simultaneous Conditioning

This represents procedure that was not commonly used in the Pavlovian experiments. Here, both the outset and offset of CS and the UCS coincide. This procedure is not often studied because it typically does not produce learning conditioning. The evident failure is peculiar, that is, it is a weak form of learning conditioning. It is observed that the temporal contiguity of CS and UCS is perfect. This is because temporal contiguity seems to be an important determinant of conditioning. This procedure ought to succeed, why doesn’t it?

One possible answer derives from a phenomenon known as overshadowing. Overshadowing refers to the fact that, if two stimuli are presented together as a compound CS, then one may dominate or overshadow the other, even through both CS would be perfectly effective if they were presented individually. For example, suppose that we present a tone and a light followed by food for many trials, until the compound is reliably producing CRS. If we later present the tone and the light separately on test trials, then it may turn out that only one of them produces CRS. Overshadowing appears to occur because one stimulus is more salient than another, thus dominating the silent one. Even though both stimuli are present, the organism seems to pay attention to only one of them.

Overshadowing may explain the failure of simultaneous conditioning because if a CS and a UCS – for example, a light and a shock-are presented together, then the shock may so dominate and overshadow the light such that the light is barely noticed (for related interpretations, see Barnet, Arnold, and Miller, 1991; Matzel, Held, and Miller, 1988; Rescorla, 1980b).

In backward conditioning, the procedures involve the presentation of the UCS before the CS. The meat powder is presented to the dog first followed with the sounding of the bell. This is another weak form of learning conditioning and Traced conditioning. This procedure occurs where the CS is presented first but terminates before the UCS is presented. The bell is sounded first and the sound dies off before the presentation of meat powder.

Discussion Activity

1. With Analyse classical conditioning as a form of learning.
2. Describe a potential experiment that would lead to response acquisition in classical conditioning.

Post your response on Study Session II forum page on course website.

Study Session Summary

Summary

In this Study Session, we discussed classical conditioning, using the Pavlov's theory of learning by association. We also looked into components as well as the processes involved in the classical conditioning.

Assessment

Assessment

SAQ 2.1(tests Learning Outcome 2.1)

I. How will you explain the Law of Frequency and the Law of Recency as espoused by John B. Watson?

SAQ 2.2(tests Learning Outcome 2.2)

I. Highlight the elements of classical conditioning.
II. Contrast unconditioned stimulus from conditioned stimulus.

SAQ 2.3(tests Learning Outcome 2.3 and 2.6)

I. Highlight the five different processes of classical conditioning.

SAQ 2.4 (tests Learning Outcome 2.4)

I. Analyse the relationship between classical conditioning and phobias.

SAQ 2.5 (tests Learning Outcome 2.5)

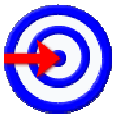
I. Explain how overshadowing could be a problem with simultaneous conditioning.

Study Session 3

Operant Conditioning

Introduction

In this Study Session, we will discuss an alternative form of learning to classical conditioning. This alternative form of learning is called operant conditioning. In the process of our discussion, we shall touch on the workers of Edward L. Thorndike and B.F. Skinner. We shall pay attention to how learning can occur, through reinforcement, differences between positive and negative reinforcements, and also explore the general principles of operant conditioning as well as the application of operant conditioning to learning process.



Learning Outcomes

When you have studied this session, you should be able to:

i. *discuss* the contributions of Edward L. Thorndike and B.F. Skinner to the development of operant conditioning .
ii. *point out* the features of instrumental conditioning.
iii. *discuss* the general principles of operant conditioning.
iv. *present* the schedule of reinforcement.
v. *apply* operant conditioning to practical use.
vi. *differentiate* between classical conditioning and operant conditioning.

3.1 Contributions of Edward L. Thorndike and B.F. Skinner to the development of Operant Conditioning

3.1.1 Thorndike's Law

Working at the Columbia University at about the same time Pavlov was studying classical conditioning in Russia, Edward Thorndike (1874-1949) set out to determine whether lower animals could solve problems by thinking. His basic approach was to present a hungry animal with a problem that it could solve in order to obtain food. In his classic experiment, he put a cat in a special puzzle box. The cat had to find a way to open a latch on the box so that it could escape and reach the food, which was placed outside the box. The cat pressed a lever, the latch was released, the box opened, and it could get to the food. Because the string pulling response was instrumental to obtaining the food, Thorndike called the form of learning exhibited by the cat instrumental conditioning. Thorndike's cat clearly learned in a trial and error fashion. The cat in the box did not simply look around, then calmly stroll over and pull the string. Rather, it gave what appeared to be random responses until it accidentally pulled the string. Once it has done so a few times, this response became more frequent because it was the only one method that led to the food .The cat would take less and lesser time on each trial to the

string pulling response. Thorndike was forced to conclude that the cats were not thinking since they learned the response gradually and mechanically. However, based on this experiment, he was able to formulate, perhaps, the most basic law in psychology, the Law of Effect. The generally law states that satisfaction increases while dissatisfaction decreases the probability that behaviour will be repeated. From this work, Thorndike derived his famous three laws.

1. **The Law of Effect–**It states that responses just prior to satisfying state of affairs are more likely to be repeated; however, responses just prior to an annoying state of affairs are more likely not to be repeated. In order words, when the connection between a stimulus and a response is positively rewarded, it will be strengthened and when it is negatively strengthened, it will be weakened (Adebayo, 2005). Thorndike later revised this law when he found that negative reward (punishment) did not necessarily motivate performance.
2. **The Law of Readiness –**This was derived by Thorndike from his experiments with rats. Satisfaction or annoyance depends on the state of neuronal readiness of an organism, since he observed that old and sluggish rats did not try very hard to escape from the puzzle box. This law states that to respond to things that potentially satisfy or annoy, the organism needs to be ready.
3. **Thorndike's Law of Exercise –** This holds that the more an S-R (Stimulus – Response) bond is practiced, the stronger it will become. As with Law of Effect, the Law of Exercise had to be reviewed when Thorndike found that practice without feedback does not necessarily enhance performance.

Hint

Thorndike laws were based on Stimulus Response hypothesis. He believed that a neutral bond would be established between the stimulus and response when the response was positive.

3.1.2 Skinner's Law

The theory of Burrhus F. Skinner is based upon the idea that learning is a function of change in overt behaviour. Changes in behaviour are the result of an individual's response to events (stimuli) that occur in the environment. Like Pavlov, Watson and Thorndike, Skinner believed in the stimulus-response pattern of behaviour. His theory dealt with changes in observable behaviour, ignoring the possibility of any processes occurring in the mind.

B.F. Skinner is widely known for the development of operant conditioning. That is why Operant conditioning is also called instrumental conditioning or Skinnerian conditioning. The term **operant**designates that the organism operates on the environment to receive a consequence, while the term *instrumental* indicates that the response is instrumental in delivering the consequence. The term *Skinnerian* gives credit to the work of B. F. Skinner, the primary advocate of operant conditioning. Instrumental conditioning is a learning process that involves changing the probability of a response by manipulating the consequences of that response (Wittig, 1977). Operant conditioning in its simplest form suggests that behaviour is a function of its consequences. Thus, a behaviour that results in pleasant consequences is more likely to

be repeated while a behaviour that results in unpleasant consequences is not likely to be repeated.

3.2 Features of Instrumental Conditioning

1. Instrumental conditioning is concerned with the acquisition and retention of instrumental responses as well as the elimination of undesired responses.
2. Instrumental response is a voluntary response made by an organism. These responses may be learned in a sequence (or chains of behaviour) so that the end-result is the attainment of a desired goal.
3. Contingency of reinforcement. Generally, instrumental conditioning occurs in situations where the actual delivery of reinforcement depends upon the appropriate response being made. This is called the contingency of the reinforcement upon the response. Suppose a student is told that he must make a certain grade in his examination before he will receive a special gift. This is a contingency situation. The accomplishment of the specified grade is the instrumental response; the gift is the reinforcement, and the giving of the gift is contingent upon the successful making of the grade.

3.3 General Principles of Operant Conditioning

3.3.1 Shaping

This is the gradual process of reinforcing closer and closer approximations of a desired behaviour. For example, a naïve, hungry rat put in a Skinnerian box has no way to figure out that pressing a bar will produce food. However, it is possible to speed up the acquisition of the bar pressing response by using a shaping procedure. This can be done by the experimenter by externally operating the mechanism to drop a pellet for every approach made by the rat towards the bar. Approaching the bar and touching the bar represent forms of behaviour that are closer to the desired response of bar pressing.

Shaping can also be used to facilitate language acquisition of a growing child. For example, a child trying to pronounce either ‘Daddy’ or ‘Mummy’ may not be able to pronounce the word at once. But any attempt by the child at saying something like “da” or “mo” may by encouraged with a smile from the mother. Though “da” or “mo” is not the correct responses, they are approximations to ‘Daddy’ and ‘Mummy’.

3.3.2 Extinction

Responses that are not reinforced are not likely to be repeated. As in classical conditioning, extinction in instrumental conditioning is the process of withholding or withdrawing reinforcement following the desired response. The consequence of its withdrawal is the decrease in the rate of responding until it reaches the pre-conditioning level.

3.3.3 Reinforcement

The term ‘reinforce’ means to strengthen. Reinforcement is used in psychology to refer to any stimulus which strengthens or increases the

probability of a specific response. Reinforcement is any consequence that has the effect of increasing the probability that the preceding behaviour will be repeated. Thus, a reinforcer is anything that follows behaviour and influences the probability that the behaviour will be repeated in future. Reinforcers can be positive, such as giving praises, or negative, such as a giving verbal reprimand.

A. **Positive Reinforcement:** This is a reward that follows a desirable behaviour. In other words, positive reinforcement means that the presence of a particular stimulus serves to strengthen or maintain a response. An increase in the stipend usually given to a student following his/her high performance at the end of a session is an example of positive reinforcement. Its effect is to maintain or increase the frequency of a desired behaviour, that is, high performance in his/her studies.
B. **Negative Reinforcement:** This is another means of increasing the frequency of a desired behaviour. Rather than receiving a reward following a desired behaviour, the organism is given the opportunity to avoid an unpleasant consequence. For example, a Lecturer may habitually criticize students for late-coming. To avoid criticisms, a given student may decide to routinely come early to class to suit the lecturer. The student is doing the desired behaviour (at least from the lecturer's viewpoint) to avoid an unpleasant or adverse consequence, the criticism. Negative reinforcement is understood as taking something away in order to increase a response. Taking away a toy until a child does his home assignment or withholding payment until a job is complete, are examples of negative reinforcement. Basically, withholding or removing something of value is meant to increase a certain response or behaviour.

   It is easy to associate "negative" reinforcement with a decrease in the rate of response. But this can be taken care of if one remembers that whether positive or negative; reinforcers always increase the rate of response. The basic thing to know is that the response rate increases when positive reinforcers are presented as well as when negative reinforcers are removed.
C. **Primary and Secondary Reinforcement:** Reinforcement can also be classified as primary or secondary. A primary reinforcement is one that is unlearned. Examples are those reinforcements that satisfy the basic physiological needs, such as food, shelter, water and sex. Social reinforcers, e.g. praises and attention, are important to humans and some animals. They are also classified as primary reinforcers.

   A secondary reinforcement, on the other hand, is learned. Secondary reinforcers are satisfying because they have been initially associated with primary reinforcers. An example of this is money. It is not important on its own, but its usefulness lies in the fact that it has been associated with obtaining primary reinforcement. It is possible to use money to buy food, build a house, etc. Other examples of secondary reinforcers include tokens, grades, status and approval.
D. **Aversive Stimulus:** An aversive stimulus is one that the subject finds obnoxious or unpleasant. For example, a naive rat is placed in an electrified Skinnerian box such that it receives mild electric shocks that make it uncomfortable. If pressing the bar could

terminate the electric shocks, then the electric shocks constitute the aversive stimulus while the termination of the shock is the negative reinforcement, which strengthens the bar-pressing response.

3.3.4 Escape, Avoidance and Punishment

In the preceding example, the bar-pressing response terminated the aversive shock. Such a response represents escape behaviour, that is, a response that removes an already present aversive stimulus. In escape, the subject experiences the aversive stimulus but subsequently gets away from it. 'Avoidance responding' means that an organism responds in a way that keeps an aversive stimulus from being delivered. In avoidance aversive control, the subject refrains from emitting a particular response and never experiences the aversive unconditioned stimulus. For example a person who quits smoking may avoid visiting his or her old friends to stop him from going back to smoking.

Punishment is presented as an unpleasant or aversive consequence of undesirable behaviour. In contrast to escape, the subject is not able to get away from the aversive stimulus by an active response. For example, coming late, stealing or being rude to a Study Session may earn a student verbal or written reprimands or even expulsion from school. Similarly, a pupil that does his take-home assignment to escape being spanked by his class teacher is acting under negative reinforcement. The negative reinforcement will enhance the behaviour of doing his assignment at home. If the pupil does his assignment before being spanked, we call the situation "avoidance" learning. If the pupil is spanked before doing his assignment, we call the situation "escape" learning.

Again, putting a child who is a bully in a room where attractive toys are not available is giving the child punishment. Punishment may also be administered through withholding of food from such a child. It is the same principle at work when a criminal is sent to prison as a form of punishment to decrease criminal tendencies. However, there is an element of positive punishment in it since the prison term is also meant to increase good behaviour.

To help users of punishment avoid the disastrous effects of mishandling of aversive contingencies, Azrin and Holz (1966) provided a list of 13 suggestions for effective punishment. These are:

1. Prevent unauthorised escape from the punishing stimulus
2. Make the punishing stimulus as intense as possible
3. Make the frequency of punishment as high as possible
4. Punish immediately after the undesired response
5. Introduce the punishing stimulus at maximum intensity
6. Punish only for brief periods to avoid adaptation and habituation by the subject.
7. Do not associate the punishing stimulus with the reinforcement or the punishing stimulus may become a conditioned reinforcer.
8. Deliver the punishing stimulus so that it is a signal that a period of extinction of the punished response is in progress.
9. Reduce the subject's motivation to emit the punished response.
10. Reduce the frequency of positive reinforcement for the punished response.

11. Make an alternative reinforcing response available.
12. Provide the subject with access to a different situation in which the same reinforcement is available without punishment, if no alternative response is available.
13. When the punishing stimulus itself cannot be given after a response, associate a CS with it, and deliver this CS after response.

3.3.5 The Partial Reinforcement Effect

Once the desired behavioural response is accomplished, reinforcement does not have to be 100%. In fact, it can be maintained more successfully through what Skinner referred to as partial reinforcement effect. Partial reinforcement consists of reinforcing some traits and omitting reinforcement on others, usually in randomized sequences. Generally, the effect of partial reinforcement (intermittent) is to allow a greater resistance to response extinction as against the continuous format (giving of reinforcement each time the desired behaviour is emitted).

3.4 Schedule of Reinforcement

This refers to the pattern or manner in which reinforcement is given following a response. Intermittent schedules are based either on passage of time (interval schedules) or the number of correct responses (fixed). It could be based on a slightly different amount of time or number of correct responses that vary around a particular number (variable). This results in four classes of intermittent schedule of reinforcement generally used by psychologists. They are the following:

3.4.1 Fixed Interval Reinforcement

Fixed interval reinforcement means providing reinforcement in a predetermined, constant schedule. In other words, the reinforcement is contingent upon a correct response being made at the end of a specified time interval. For example, the rat placed in a Skinnerian box must make one correct response at the end of a three-minute interval. Responding is not required at any other time during the interval, and the interval never changes.

Another example is a managing director of a block-moulding industry that drops by at his factory site every Friday afternoon to give commendation to his workers. This may not necessarily maintain high levels of performance. If the employees know that the manager will drop by to check on them every Friday at 2.00p.m., they are likely to be working hard at that time hoping to gain praises or avoid the manager's anger. But on other days, the employees may not work as hard as possible because they already know that the manager will not come.

3.4.2 Variable Interval Reinforcement

This schedule also uses time as the basis for applying reinforcement but varies the interval between reinforcement. Reinforcement is contingent upon the subject's giving a correct response at the end of a period, which may vary. Our manager may decide to visit his factory any day instead of his usual Friday. This is an example of variable interval reinforcement.

Thus, he may vary his time of visit from day- to-day. Since the employees do not know when the manager will call at the factory site, they are probably to be on the watch by working fairly hard every day. They may relax after the visit of the manager.

3.4.3 Fixed Ratio Reinforcement

The fixed variable ratio schedule gears reinforcement to the number of desired or undesired behaviour rather than to blocks of time. Under the fixed ratio schedule, the number of behaviour needed to obtain reinforcement is constant throughout the procedure. This means that the subject is expected to make a certain number of responses before reinforcement can be delivered. For example, the rat must make 10 bar presses before food will be delivered to it. The number of blocks needed to gain reinforcement is held constant by the manager. He may set a production level of 100 units to obtain reinforcement. For every 100 blocks produced, the employees get some kind of reinforcement.

3.4.4 Variable Ratio Reinforcement

Under the variable ratio schedule, the number of behaviour required for reinforcement is based on the subject's making a number of responses that vary from trial to trial. For example, the naïve rat placed in the Skinnerian box could be reinforced after 3, 13, 7, 20, 15 and 5 responses. The most important thing is that the animal has no way of knowing exactly when a response will be reinforced.

Variable interval and, especially, variable ratio schedules produce steadier and more persistent rates of response because the learners cannot predict when the reinforcement will come although they know that they will eventually succeed.

3.5 Applications of Operant Conditioning

One practical application of operant conditioning is that it can be used to change people's behaviour, that is, elicit behaviour modification. Behaviour modification is the application of operant conditioning techniques to modify behaviour. It may be used to help people with a wide variety of everyday behaviour problems, which include obesity, smoking, alcoholism, delinquency, and aggression. It has been successfully used in child rearing, in school systems, and in mental institutions. It requires that we understand how to administer various types of reward and that we observe the responses to these rewards by particularly reinforcing acceptable responses. It also requires that we use both non-reinforcement and punishment to extinguish unacceptable responses.

One example of a therapeutic use of behaviour modification is the token economy method. This system can be used for adults as well as children. It involves the use of plastic chips or play-money. After a short while, these can then be exchanged for sweets, toys, biscuits, etc. and other primary reinforcers. This is to increase the frequency of the desired behaviour.

3.6 Classical Conditioning versus Operant Conditioning

3.6.1 Involuntary and Voluntary Behaviour

There is a sharp difference between operant behaviour and classical conditioning. In the former case, a response is emitted whenever an animal chooses whereas in the latter case, a response is elicited or called forth by a stimulus applied to the organism. In a way, the response in operant conditioning is voluntary while that in classical conditioning is involuntary. For example, in Pavlovian conditioning, the powder meat causes the dog to salivate and not the ringing bell. Pairing the bell with the meat gives the bell the power to elicit salivation, whether the dog likes it or not. On the other hand, humans and other animals perform all kinds of actions that do not seem to be 'elicited' or called forth. Behaviour is rather emitted on the basis of the consequence we get.

3.6.2 Identification of Stimuli

In classical conditioning, the unconditioned response is elicited by an UCS, and in the course of conditioning, a CS also comes to elicit a response. Whereas in operant conditioning, there is neither a well-defined UCS that will reliably elicit a response nor a CS to which the response becomes attached.

3.6.3 Contingent and Non-contingent Reinforcement

Another basic difference between classical conditioning and instrumental conditioning lies in the relationship between responses and reinforcements. In classical conditioning, the reinforcement is delivered without regard to the animal's behaviour, that is, reinforcement is non-contingent on the response. But in instrumental conditioning, reinforcement is contingent on the animal's behaviour that is, the delivery of reinforcement depends on whether the animal has made an appropriate response or not.

Discussion Activity 2.1

1. Discuss the concept of contingency of reinforcement.
2. Present an experimental scenario of operant conditioning with respect to learning as a change in human behaviour.

Post your response on Study Session III forum page on course website.

Study Session Summary

Summary

In this Study Session, we examined operant conditioning. In the process, we examined the following contributions of the following to the development of operant conditioning: Edward L Thorndike (1874-1949), John B Watson (1878-1958), Burrhus F Skinner (1904-1990). We also talked about the differences between classical conditioning and operant conditioning.

Assessment

Assessment

SAQ 3.1 (tests Learning Outcome 3.1)

I. Discuss Edward Thorndike's experimental methods of explaining stimulus-response hypothesis.
II. Succinctly describe Skinnerian conditioning in your own words.

SAQ 3.2 (tests Learning Outcome 3.2)

I. What are the classical features of instrumental conditioning

SAQ 3.3 (tests Learning Outcome 3.3)

I. Briefly analyse the general principles of operant conditioning

SAQ 3.4 (tests Learning Outcome 3.4)

I. What schedule of reinforcement do you think works best? Give reason for your choice.
II. Itemise the limitations you would attach to the other schedules.

SAQ 3.5 (tests Learning Outcome 3.5)

I. Point out practical ways operant conditioning may be applied in humans

SAQ 3.6 (tests Learning Outcome 3.6)

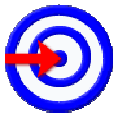
I. How does operant conditioning differs from classical conditioning?

Study Session 4

Learning Theories

Introduction

The central focus of this Study Session is observational learning. Observational learning takes place when the ability to perform behaviour is acquired or modified by observing others. We shall examine the contribution of Albert Bandura to the development of observational learning.



Learning Outcomes

When you have studied this session, you should be able to:

i. *discuss* social learning theory .
ii. *explain* the processes involved in latent learning.
iii. *explain* the theory of insight learning.

4.1 Social Learning Theory

4.1.1 Contribution of Bandura to Social Learning Theory

Albert Bandura contributed immensely to the development of the cognitive Social Learning Theory (SLT) (see Bandura and Walters, 1963; Bandura, 1977; 1986; 1989). Bandura (1977) assails the notion that consequences alone cannot be viewed as the determinant of action. “Consequences”, he writes “generally produce little change in complex behaviour when there is no awareness of what is being reinforced”.

Human development, according to Bandura’s SLT, reflects a complex interaction of the person, the person’s behaviour and the environment. The relationship between these elements is called *reciprocal determinism*. A person’s cognitive abilities, physical characteristics, personality, beliefs, attitudes, etc influence either his or her behaviour and environment. A person’s behaviour can affect his feelings about himself and his attitudes and beliefs about others. Likewise, much of what a person knows comes from environmental sources, such as TV, radio, parents, and books. Environment also affects behaviour since what a person observes can influence what he does. Conversely, a person’s behaviour also contributes to his environment.

Observational learning occurs when an observer’s behaviour changes after viewing the behaviour of a model. An observer’s behaviour can be affected by the positive or negative consequences (vicarious reinforcement or vicarious punishment) of a model’s behaviour. The guiding principles of observational learning include the following:

1. The observer will imitate the model's behaviour if the model possesses characteristics (e.g. talent, intelligence, power, good looks and popularity) that are attractive to the observer.
2. The observer will react to the way the model is treated and mimic the model's behaviour. When the model's behaviour is rewarded, the observer is more likely to reproduce the rewarded behaviour. When the model is punished, an example of vicarious punishment, the observer is likely not to produce the same behaviour.
3. A distinction exists between an observer's "acquiring" behaviour and "performing" behaviour. Through observation, the observer can acquire the behaviour without performing it. The observer may later display the behaviour in situations where there is an incentive to do so.

Hint

Those performing the behaviours and being observed are called models.

ITQ

- Analyse Bandura's contribution to social learning theory
- Bandura reflects a complex interaction of the person, the person's behaviour and the environment. He demonstrates reciprocal determinism. Reciprocal determinism posits that person's cognitive abilities, physical characteristics, personality, beliefs, attitudes, etc influence either his or her behaviour and environment.

4.1.2 Observational Learning

Observational learning has four processes: attentional span, retention processes, motor reproduction processes, and motivational processes (Bandura, 1989). *Attentional span* refers to a person's ability to selectively observe actions and behaviours in his or her environment. In addition, attentional span mediates the specific information that is extracted from each observation. This process is influenced by characteristics of the model, (such as how much one likes or identifies with the model) and by the observer (such as the observer's expectations or level of emotional arousal). For example, the complexity and salience of a modelled activity will influence the amount of attention a person gives to that activity. In addition, observers are most likely to selectively attend to, and model, behaviours of people that are most like themselves and those that they associate with most.

Observed behaviour or activities can only be modelled if they are retained in one's memory. Observers, therefore, must not only recognize the observed behaviour but also remember it at some later time. *Retentionprocesses* are made possible by the human ability to form symbolic coding, cognitively organize the symbols and rehearse the coded symbols already stored in memory.

Once symbols are formed and stored in one's memory, they must be converted into appropriate action for modelling to occur. This process is referred to as *motor reproduction processes*. Observers must be physically and intellectually capable of producing the act. In many cases,

the observer possesses the necessary responses. Sometimes, reproducing the model's actions may involve skills the observer has not yet acquired. For example, it is one thing to carefully watch a circus juggler, but it is quite another to go home and repeat those acts.

Lastly, the degree to which behaviour is seen to result in a valued outcome (expectancies) will influence the likelihood that one will adopt a modelled behaviour. This is referred to as the *motivational process*. In general, observers will perform the act only if they have some motivation or reason to do so. The presence of reinforcement or punishment, either to the model or directly to the observer, becomes most important in this process.

Attention and retention account for acquisition or learning of a model's behaviour, production and motivationally control the performance.

4.2 Latent Learning Theory

4.2.1 Tolman's Latent Learning Theory

Tolman (1932) called his theory **purposive behaviourism**. It was purposive because he viewed behaviour as directed towards certain goals. He felt it was only appropriate to study observable stimuli and responses – thus the occasional designation as a neoclassicist. However, Tolman viewed learning primarily as a cognitive process, that is, a matter of acquiring beliefs and knowledge about the environment and then demonstrating that knowledge by acting in purposeful goal-directed ways. The emphasis here is on cognition as opposed to a set of S-R connections.

An animal, a rat or a person, is said to acquire a cognitive map of the environment showing the location of food and the key of the land, as opposed to a set of S-R connections mechanistically propelling the organism along the path to a goal. Thus, it represents a kind of information processing theory. While not denying the importance of S-R learning theory and the role of reinforcement in learning, Tolman was convinced that several varieties of learning could not be explained in S-R terms and seemed to place less importance on the role of reinforcement.

In Tolman's view, reinforcement is unnecessary for learning, although it provides an incentive for performance. In demonstrating the importance of cognitive map over reinforcement, Tolman emphasized the role of latent and manifest learning

4.2.2 Latent Learning and Manifest Learning

Latent learning refers to the acquisition of knowledge hidden from the views of an external observer. However, at a future time, the present learning may become open to the view of an external observer by way of discussion or performance. In that case, we talk about **manifest learning**. For example, when we give a person an instruction to go somewhere, the person may not necessarily follow a stimulus –response strategy. He may end up using his cognitive map to get there through a different route.

Tolman's experiment with rats helped lay the theoretical foundation for cognitive maps. In his view, reinforcement is unnecessary for learning,

although it provides an incentive for performance. Thus, a rat should be able to acquire knowledge of the way through a maze – to develop a cognitive map even in the absence of reinforcement. He studied latent learning in rats using a 14-unit T-maze. He placed hungry rats in the maze and did not reward them for going through the T-maze. Another set of rats was not given the opportunity to try the T-maze initially; they were later placed in the T-maze. Those rats that had previously been in the maze, but which had not been rewarded, performed better than those that were not previously in the maze. Apparently, the rats that had been in the maze retained a mental map of it, and this was unconnected to receiving any reward. In other words, the rats that had been in the T-Maze were able to manifest the learning they initially obtained (latent learning) in their first encounter with the T-maze. Hence, their better performance than those rats that had no such encounters (latent learning). Tolman is famous for his assertion that organisms will generally follow the easiest path to a goal and thus demonstrate the non-importance of reinforcement in learning

4.3 Insight Learning Theory

4.3.1 Gestalt Theory of Insight Learning

The subject of discussion in this Study Session is insight learning. This subject is to be examined within the context of the Gestalt theory.

Gestalt theory focuses on the mind's perceptive processes (Kearsley, 1998). Gestalt is a German word for 'figure', 'shape', 'form', or 'pattern' (*Encyclopedia Britannica*, 1999). Gestalt theorists espouse the basic principle of the theory that the whole is greater than the sum of its parts. In other words, the whole (a picture, a car etc.) carries a different and altogether greater meaning than the sum of its individual components (paint, canvas, tires etc.). Though Gestalt theory applies to all aspects of human learning, it applies most directly to perception and problem-solving. It emphasizes that we perceive objects as well-organised patterns rather than separate component parts. According to this theory, when we open our eyes to perceive a material phenomenon, we do not see fractional particles in disorder. Instead, we notice larger areas with defined shapes and patterns. The 'whole' that we see is something that is more structured and cohesive than a group of separate particles.

The focal point of Gestalt theory is the idea of 'grouping' or how we tend to interpret a visual field or problem in a certain way. The main factors that determine grouping are:

1. **Proximity:** Elements tend to be grouped together, depending on their closeness.
2. **Similarity:** Similar items tend to be grouped together, rather than dissimilar ones.
3. **Closure:** Items are grouped together if they tend to complete a pattern.
4. **Simplicity:** Items are organized into figures, according to symmetry, regularity and smoothness.

These factors are called the laws of grouping or organization (Kearsley, 1998) and are explained in the context of perception and problem-solving.

The founders of Gestalt theory are the Germans, Max Wertheimer, Wolfgang Kohler and Kurt Koffka. These theorists focused on different aspects of Gestalt. Wertheimer applied Gestalt theory to problem-solving. According to Wertheimer, the parts of a problem should not be isolated but instead should be seen as a whole. This way, the learner can obtain a "new, deeper structural view of the situation" (Kearsley, 1998).

Wertheimer developed a concept of "pragnanz" (the German word for "precision"), which states that "when things are grasped as wholes, only a minimum amount of energy is exerted in thinking" (*Encyclopedia Britannica*, 1999). In addition, directed by what is required by the structure of a situation . . . one is led to reasonable prediction, which, like the other parts of the structure, calls for verification, direct or indirect. Two directions are involved: getting a whole consistent picture, and seeing what the structure of the whole requires for the parts (Kearsley, 1998).

Koffka applied Gestalt theory to applied psychology and child psychology. His research with infants led to a theory that infants "initially experience organized wholes" as opposed to discrete elements (*Encyclopedia Britannica*, 1999) kohler's experiments with animal learning led him to conclude that they exhibited "insight", (Driscoll, 1993). Relations among stimuli and responses were learned, and not natural or automatic as claimed by the behaviourist theory. In these experiments, apes were subjected to different trials of having to obtain food that was just out of their reach. They learned how to construct a way to get the food. They could stand on a box to get it, or make a long stick to reach it. Kohler emphasized that through trial and error, the apes generated an "interconnection based on the properties of the things themselves" (Driscoll, 1993) and thus developed an insight on how to get the food based on the tools they had available at a given time.

Discussion Activity 4.1

1. Compare classical conditioning with purposive behaviourism.
2. What would you say are the limitations of stimulus-response theories?

Post your response on Study Session IV forum page on course website.

Study Session Summary

In this Study Session, we discussed how human behaviour is acquired by watching another person (the model) perform that behaviour, according to Bandura. In the process, we examined four basic observational learning process which includes: attention, retention, reproduction, and motivation. We also discussed Tolman's view of learning primarily as a cognitive process. Finally, we have discussed insight learning through the

Gestalt theory. This theory states that the whole is greater than the sum of its parts. The founders of Gestalt theory were the Germans, Max Wertheimer, Wolfgang Kohler, and Kurt Koffka.

Assessment

Assessment

SAQ 4.1 (tests Learning Outcome 4.1)

I. Describe the guiding principles of observational learning.
II. List the four processes involved in observational learning.

SAQ 4.2 (tests Learning Outcome 4.2)

I. Explain the theory of purposive behaviourism.
II. Distinguish between latent and manifest learning.

SAQ 4.3 (tests Learning Outcome 4.3)

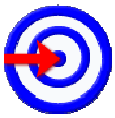
I. What is the focal point of the Gestalt theory?
II. What are the main factors in grouping under Gestalt theory?

Study Session 5

Psychological Principles and Learning

Introduction

The acquisition of new materials in a learning process can indeed be aided by a number of psychological variables. In this Study Session, you will learn the characteristics of the learner and the general factors which may impact on the learning possibilities of a student.



Learning Outcomes

When you have studied this session, you should be able to:

i. *point out* the characteristics of a learner that may influence his/her learning.
ii. *present* the general factors that 'impact on the learning ability of a student.

5.1 Learner Characteristics

The qualities a learner brings to a learning situation may affect how acquisition progresses. These may include physical development, motivation, and the expression of emotion, interests and attitude.

5.1.1 Physical Development

As individuals develop through life, there are different opportunities and constraints in learning. Learning is most effective when different developments within and across physical, intellectual, emotional and social domains are taken into consideration. Individuals learn best when the material is appropriate to their level and presented in an enjoyable and interesting way. Because individual development varies across intellectual, social, emotional, and physical domains, achievement in different instructional domains may also vary. Thus, the cognitive, emotional, physical, and social development of individual learners and how they interpret life experiences are affected by prior schooling, home, culture, and community factors. Early and continuing parental involvement in schooling, the quality of language interactions and two-way communications between adults and children can influence these developmental areas. Awareness and understanding of developmental differences among children with and without emotional, physical or intellectual disabilities can facilitate the creation of optimal learning contexts.

5.1.2 Motivation

What and how much is learned is influenced by the learner's motivation. Motivation to learn is in turn influenced by the individual's beliefs,

interests and goals, self-efficacy, locus of control and of thinking habits. The rich internal world of thoughts, beliefs, goals, and expectations for success or failure can enhance or interfere with the learner's concentration on and interest in the learning exercise. Furthermore, the nature of learning has a marked influence on motivation. Educators need to be concerned with facilitating motivation through strategies that enhance learner's effort and commitment to learning and to achieving high standards of comprehension and understanding.

5.1.3 The Expression of Emotions

This may also be affected by an individual's readiness to learn. Such emotional stress may take the form of depression, rejection, inferiority complex, deprivation, etc. Positive emotions, such as curiosity, enhance and facilitate learning and performance. Mild anxiety can also enhance learning and performance by focusing the learner's attention on a particular task. However, intense negative emotions (e.g. anxiety, panic, rage, insecurity) and related thoughts (e.g. worrying about competence, ruminating about failure, fearing punishment, ridicule, or stigmatizing labels) generally interfere with learning, and contribute to low performance.

5.1.4 Social Influence

Learning is influenced by social interactions, interpersonal relations and communication with others. Quality personal relationships that provide stability trust, and caring can increase a learner's sense of belonging, self-respect and self-acceptance, and also provide a positive climate for him/her to learn. Positive learning contexts help learners feel safe to share ideas, and actively participate in the learning process.

5.2 General Factors

5.2.1 Overlearning

Suppose a criterion of performance (such as one perfect recitation of a poem) is used to represent learning. Once a subject has recited the poem perfectly from memory, learning has been achieved. Any practice that occurs after this criterion has been reached is called over learning. Overlearning is usually regarded as a percentage of the time or number of trials needed for original learning. Suppose a subject took 16 trials to learn a list of nonsense syllables. If the subject then continued to practice the correct order of this list for 8 more trials, 50% overlearning would have occurred. Research evidence suggests that 5% overlearning usually results in a significant improvement in a subject's acquisition and retention of material; 100% overlearning helps some more, but not tremendously, over 100% results in little improvement (Wittig, 1977).

5.2.2 Distribution of Practice

Distribution of practice allows segmentation of learning material. After learning some segments of information, there should be a period of rest so as to allow for greater acquisition of new materials, when the learning exercise re-starts. Acquisition of new materials seems to proceed more

easily if studying is divided into study sessions and breaks. This assumes that the study segments are not too short and the breaks are not too long.

5.3 Active versus Passive Approach in Learning

Careful study of the acquisition of new materials has shown that a subject who plays an active role in acquisition generally shows better performance than does a passive subject.

5.4 Primacy and Recency Effects

Primacy refers to those materials that are presented first in a series. **Recency** refers to the items presented last. In general, the primacy and recency effects tend to encourage acquisition whereas presenting materials in the middle of a series does not.

Knowledge of Result–Feedback: Any information about the effect of a response is called Knowledge of Results (KR) or feedback. Two findings indicate the importance of KR in acquisition situation: KR leads to faster acquisitions of new materials and immediate KR is often more beneficial than delayed KR. It appears that in many circumstances, the subject treats KR as a sort of reinforcement, and delay of KR is the equivalent of delay of reinforcement.

Study Session Summary

Summary

In this Study Session, you learnt how some psychological factors affect the learner in the course of learning new materials. We also examined the characteristics the learner brings to the learning situation, and how these factors influence or slow down the rate level of acquisition or of the learner.

Assessment

Assessment

SAQ 5.1 (tests Learning Outcome 5.1)

I. Analyse the components that comprises physical development and how they influence learning
II. Explain how motivation affects learning.
III. Itemise different emotions that are important in a person's learning.

SAQ 5.2 (tests Learning Outcome 5.2)

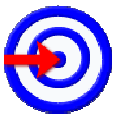
I. Describe overlearning and what effects you think it might have on learning ability.

Study Session 6

Human Memory: Origin and Basic Processes

Introduction

Who are you? What are you like as a person? What kinds of life experience have you had? Only memories can provide you with the information you need to answer these questions. Considering the foreign, the focus of this Study Session is on human memory. In the process of discussion, we shall pay particular attention to the origins of the human memory and the processes involved.



Learning Outcomes

When you have studied this Study Session, you should be able to:

i. *explain* the central claims of the evolutionary theories of memory.
ii. *discuss* the process of encoding, storage and retrieval.
iii. *identify* and *discuss* at least two system memory models.

6.1 Memory Evolution

Memory processes that are used to acquire, store, retain and later retrieve information.

Evolutionary theories hypothesize that **memory**, like learning, arouse as a response to environmental demands and serves as an adaptive mechanism. It allows the animal to retain information about its environment and thereby survive within the environment. Remember, the locations of food sources, the identity of a mate, and the association of certain stimulus with impending danger can be important to the survival of a species. It is for these reasons that evolution has favoured those species that develop adequate memory functions. Memory exists because it is useful mechanism that permits the animal to repeat helpful behaviours and avoid repeating harmful behaviours. Evolutionaries state that each species uses memory to adapt to its environment.

Human memory has also evolved adaptively. (One modern-day evolutionary result of this adaptive need may be the superior spatial location ability of females; it may have risen as an adaptation to the crucial role of women in gathering food and living materials during ancient times (Buss, 1995))

6.2 What is Memory?

Memory refers to the retention of materials or information acquired in the course of learning and the ability to retrieve such information when required. **Retention** is the preservation of some aspect of experience across time, and retrieval is the re-enactment or recapture of some aspect of a past experience (Walker, 1995) In other words, retention is seen as the storage of learning over a period of time, called retention interval

(some length of time following acquisition); while retrieval is seen as getting the responses out of storage (Adebayo, 1995).

6.3 Memory Process

6.3.1 Encoding, Storage, and Retrieval

The information processing of the human memory is usually done through encoding, storage and retrieval, which can be best instantiated in the following way. Assuming you were asked to memorize the following numbers (202) 523-3598.Having completed the task of memorizing the number, how then do we remember anything about the number. In the first instance, the information memorised must be transferred into a mental representation, an image in your mind. The information about the mental representation is called encoding because the actual object is represented by memory code. Information about the external world reaches our sense as physical and chemical stimulation. When this information is encoded, it is converted into psychological formats that can be mentally represented. This mental conversion is usually done through the use of visual, acoustic, semantic, and motor coding. In our example, the numbers are represented in our visual memory code as some visual image, words or pictures. Acoustic coding uses the sound of words to encode the material, while semantic coding represents the information in memory in terms of meaning. Though it is not usually thought of as one of the major types of coding, motor encoding still has a role to play. It involves learning and remembering physical skills. For example, swimming is easy once you master the skills involved, but to describe the skills to someone who does not swim will not be easy. This is because specific skills which involve muscular movement cannot be easily verbalized due to motor coding. Once mental image or picture of the number is encoded, it must be placed in storage for future usage. Storage is the second stage of memory. It refers to the retention of memorized material or information over a period of time. In other words, retention is the act of maintaining information over time. This can be achieved through rehearsal. Retrieval is the process by which previously encoded, stored memories are brought back for current use. It also involves locating the stored information and returning it to consciousness. A particular cue, like number “(202) 523-3598” for example, can cause you to retrieve information that you had previously encoded and stored. One way to think of these basic memory processing terms of information-processing theory is to see human memory processing as analogous to the operation of a computer. Information enters through the senses (key board); this information is stored somewhere in the brain (hard or floppy disk), and it is retrieved (brought up on the monitor screen) when needed. This process of encoding, storage and retrieval will help us to understand the three systems of memory models (sensory, short term, and long term).

6.3.2 Recognition, Recall and Re-learning

How are memories encoded, stored and retrieved? What factors contribute to success and failure? The answer to these questions can only

come through research, and three principal approaches account for much of that research.

Recognition refers to the ability to identify something you have seen before. For example, every time you take a multiple-choice exam, you are undergoing a test of recognition.

Recall means that you are asked to remember something you have previously learned without presently seeing the word or material. In recognition task, you see the word and simply have to remember that you have seen it before; the recall task provides no such cues. While **re-learning** means that you re-study the material or information to be learned and learn it again. A familiar example of re-learning (also called the method of saving) is studying for final exam. Assuming you have studied the course material throughout the semester, it should take you much less time to re-learn the material in preparing for your finals.

Discussion Activity 6.1

Using contemporary day-to-day examples explain ways in which human memory has evolved.

Post your response on Study Session VI forum page on course website.

Study Session Summary

Summary

This Study Session has focused on the origins and the processes involved the human memory. We discussed some theories of memory evolution, what memory is all about, and the significance of encoding, storage and retrieval as well as recognition, recall and re-leaning to the human memory.

Assessment

Assessment

SAQ 6.1 (tests Learning Outcomes 6.1 and 6.2)

I. What is the implication of the evolutionary theories that have been hypothesised about memory?
II. Distinguish between memory, retention and retrieval.

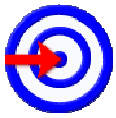
SAQ 6.3 (tests Learning Outcome 6.3)

I. Briefly explain the process via which retrieval of information occurs.
II. Distinguish between recognition, recall and re-learning.

Study Session 7

Thinking

Introduction



Learning Outcomes

This Study Session focuses on the role of thinking in the learning process. We shall examine how the thinking capacity of man contributes immensely to his learning process.

When you have studied this session, you should be able to:

i. *discuss* the relationship between the concept of learning and thinking.
ii. *highlight* the tools of thoughts.

7.1The Thinking Process

The *Oxford Advanced Learners Dictionary* defines thinking as the act of:

1. using, exercising, the mind in order to form opinions, come to conclusions;
2. to imagine;
3. to form a conception of;
4. to reflect, recall, to consider.

Thinking therefore overlaps with other mental activities.Thinking can be defined as a specific behaviour, which entails an individual using symbolic representations of events and objects, and manipulating ideas, images or concepts. Thinking is implicit, that is, it cannot be observed directly but must be inferred from its products, knowledge, remembering skills, abilities, and intentions and so on.

The word "thinking" commonly refers to two broad classes of symbolic activities:

A. **Associative or non-directed thinking:** Here, the flow of symbolic activity is not controlled or manipulated for an explicit purpose. This includes daydreaming, free association, autistic thinking, delusions, hallucinations and the like.

B. **Directed thinking:** This is the phenomenon that most psychologists identify and study as proper thinking. This exercise includes problem solving, concept learning, verbal learning, imagery or imagination, creativity, memory encoding, insight, computer simulation and cybernetics.

7.2 Tools of Thought

Thinking always involves the manipulation of mental symbols, representative of external reality, and may have a more or less directed

problem solving character (Winefield and Peay, 1981). The material of thought may consist of verbal or non-verbal images, symbols and concepts.

7.2.1 Images

An image is a sensory experience not based on immediate sense data; a re-creation in the mind's eye' or mental representation of a perceptual event. Images form the basic tool of cognitive function. They help us to classify and describe new experiences through the process of matching with past ones. They form the basis of memory, and they may at times be evoked or recalled purely for the pleasure that results, as in poetry appreciation. Images commonly have emotional associations. Smells, in particular, evoke the past.

Body image – our cognitive representation of our physical self – has very powerful emotional meaning. Discrepancies between this image and reality are common during:

1. self-conscious adolescence;
2. after physical trauma (amputation and phantom-limb experiences); and
3. in cases of both obesity and extreme thinness (anorexia this is loss of appetite not extreme thinness).

We have cultural ideals for a body for either sex. We learn social conventions regarding who may touch different parts of the body. All these have obvious relevance to the clinical encounter.

7.2.2 Symbols

Symbol A thing that represents or stands for something else.

Symbols constitute other tools of thought. Symbols stand for something other than themselves. They are related more indirectly than are images. For example, a given colour will symbolize different emotions in different cultures. *Green* in the hospital setting is seen as being relaxing; some people see the colour it as jealousy.

7.2.3 Concepts

Concepts An idea of something formed by mentally combining all its characteristics or particulars.

Concepts constitute vital tools of thought. A concept stands for a class of objects or events with some attributes in common. Concepts vary in their level of abstraction that is, being able to separate objects and events from what is real or concrete; think of these attributes separately from facts, objects or particular examples. Experiments on how adults learn new concepts reveal that discovering and using concepts involves complex thinking. The subjects may be shown a series of geometric forms that vary in shape, colour and size. The experimenter may have decided that all large, red forms are members of a newly invented concept, BEP.

The subject's task is to discover the properties of BEP. Forms are represented one at a time and the subject guesses whether each is a BEP. The experimenter tells him/her whether the choice made is correct. This allows the subject to generate hypotheses about relevant dimensions – for example, colour red. When he/she comes across a figure that fits his/her hypothesis but not the experimenter's definition, for example, a small,

red figure, he/she abandons the current hypothesis and generates a new one (large, red figure).

The more defining properties there are, the longer it takes to learn concepts. A concept that is defined by *large, red* and *square* is harder to spot than one defined by only *large* and *red*.

The ability to form and use abstraction, a higher order concept in a logical and flexible way is a valued cognitive skill, which develops gradually through experience. It is vulnerable to the effect of brain damage and mental illness. At the earliest, it is completed only at the end of primary school. Any one who wishes to communicate with children, or those who seek to understand brain function at different ages, needs to understand the stages of conceptual development.

Conceptual Development

Jean Piaget, a Swiss psychologist, drew attention to the mechanisms by which children develop logical concepts and learn to understand the world.

Piaget regards thinking as a specific instance of adaptive behaviour, of coping with the environment and organizing (or re-organizing) thought and action. Adaptation begins with the random, diffuse, mass reflexes of the neonate state and progresses, by stages, to the formal logical reasoning of adulthood. According to Piaget, the growth of adaptation always involves two complementary processes, namely assimilation and accommodation.

In assimilation, a child incorporates and utilizes stimuli from the environment, interpreting new situations in terms of familiar ones, fitting the unfamiliar into his available "organization" and reacting as he has in past situations.

Accommodation occurs when environmental stimuli demand new reactions in familiar situations, that is, when learned responses are no longer adequate and the child must "accommodate" to the situation by changing his behaviour.

Piaget identified three major stages of conceptual development; namely, sensori-motor operations; concrete operations and formal operations. Several phases can be identified for each stage.

Stage One: Sensori-Motor Operations

This first stage extends from 0 months to 2 years and has six identifiable phases.

Phase 1: Exercises of reflexes (-1 month)

Phase 2: Coordination of reflexes and responses (1 – 4 months). Hand movements and eye movements; reaches for objects, groups and sucks them.

Phase 3: Anticipates events and intentionally repeats responses that produced results, looks for objects (4 – 8 months).

Phase 4: Differentiates *means* from *ends*, using established responses to attain goals. Before this time, babies behave as though "out of sight is out of mind" is the guiding rule. If a toy is

hidden, interest in it at once disappears. Fading images of mother's face cause no alarm; however, by six months, they cause distress. Babies would start to search for hidden toys, remove obstacles and so on (9 – 10 months).

Phase 5: Experimentation, exploration, variation and modification of behaviour; curiosity appears. Baby tries things out by banging, shaking and dropping (11 – 12 months).

Phase 6: Emergence of capacity to respond to, think about objects and events that are not immediately observable, and to invent new means of accomplishing goals. Child demonstrates the beginnings of symbolic activity by deferred imitation, and the first words of speech.

Stage Two: Concrete Operations

This stage has three identifiable phases, extending from around 18 months/2 years to 11/12 years.

Phase 1: **Pre-conceptual (2-4 years):** a child begins to regard stimuli as representatives of other objects. Uses a chair as a bus, and so on.

Phase II: **Period of initiative thought (4-7 years):** a child at this stage can conceptualize more, construct more complex thoughts and images, and group objects into classes. However, a change in form necessarily produces a change in amount. Therefore, thinking lacks reversibility – the ability to mentally undo an action and imagine the result. The child lacks the concept of conservation: that quantity remains constant despite changes in appearance.For example, for a child, liquid poured into a taller glass has become more than it was when in a wider glass.

Fig 7.1 Same amount of water in two glass container

This failure to decentre attention and take account of several variables simultaneously results in not seeing other people's point of several variables or understanding that their point of view may be different.

Therefore, the pre-operational child thinks in a way, which is qualitatively different from an older person. The thinking is relatively pre-logical, intuitive and even magical. For example, the understanding of the concept of death in children.

Phase III: **Concrete Operation (7-11 years):** The child gradually acquires conversational concepts and is no longer deceived by how things look. He uses logic and reasoning in an

elementary way, but he applies them only in the manipulation of concrete objects, not of verbal manipulations. He can order a series of dolls or sticks but not:

E is taller than S

E is shorter than L

Who is tallest?

This requires "Formal operation"

Stage Three: Formal Operations

The final stage begins early in adolescence from eleven to fourteen years onwards. This is a truly scientific, hypothesis-testing "what if" stage – able to consider alternative hypothetical possibilities and not constrained by available choices. He can consider general laws, reason deductively, make hypothesis, and keep, many variables in mind.

5 bottles: 1 2 3 4 5	1 3 5 – brown
(Neutral)	(Colour reducing)

Solution comes little by little.

The sequence described above appears without a lot of variations in children of different nationalities, social classes and intelligence. However, the chronological age may vary as demonstrated by Soviet researchers.

Discussion Activity 7.1

1. Compare and contrast associative thinking and directed thinking.
2. Explain human body images as they relate to cultural ideals.

Post your response on Study Session VII forum page on course website.

Study Session Summary

Summary

In this Study Session, we have focused on the thinking process, a veritable tool in the learning exercise. In the discussion, we defined the concept of thinking, examined the tools of thought, and also dilated on the three stages of conceptual development.

Assessment

Assessment

SAQ 7.1 (tests Learning Outcome 7.1)

Discuss thinking and how it relates to the learning process.

SAQ 7.2 (tests Learning Outcome 7.2)

I. Analyse “images’ as a toll of thought.
II. Define “symbols” as a tool of thought.
III. Define “concepts” and explain how it is a tool of thought.

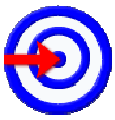
Point out the 3 major stages of conceptual development and describe the different phases in each.

Study Session 8

Language Development

Introduction

Language has been said to be man's finest asset. A branch of psychology - psycholinguistics - studies language as an aspect of the behaviour of individuals. In this Study Session, you will explore the concept of language which is human specific.



Learning Outcomes

When you have studied this session, you should be able to:

i. *point out* the characteristics of language.
ii. *explain* how language is developed in an individual.
iii. *discuss* the significance of language to human development.
iv. *analyse* the relationship between language and thinking skills.

8.1 Definitions and Characteristics of Language

Language The psychological processes, which regulate speech.

Language is the means of communication, which involves vocalized (speech) that embodies units of meanings (words) arranged according to certain rules (grammar). Speech is language behaviour. It has developed in the course of human activity, which involves material transformation of the surrounding world.

Language is the system of signs that serves as a means of human communication and mental activities

Reflection

Man can appropriately be described, as the "talking ape" for it is the power of speech more than the absence of a shaggy coat (naked ape) that sets human beings apart from other primates.It is impossible to think of human culture or civilization in the absence of language. Many essentially human activities spring from this unique characteristic by which man becomes detached from his physical world. He can indulge in reveries and imaginings. Without the spoken or written words, there could be little or no transmission of knowledge, from individual to individual or generation to generation.

There are two basic requirements for speech to become language; namely, it must be **systematic** and **symbolic**.

We may regard language in a somewhat atomistic fashion by looking at it as a collection of words strung together in sentences, each word having a separate identity and meaning. This is a false conception of language. The words are brought together in special ways to give a highly systematic order from which we get a meaning. Similarly, there is no one meaning for each word in a sentence. The meaning we ascribe to a sentence can change from one context to another. Consider this newspaper headline.

"Senator Akpan's burial used for party talk"

The reader would ask, "Is it disco party or political party talk?"

Altering the position of words in a sentence alters the sense of the sentence – although the same words are there. For example, "The sun is shining" is different from "Is the sun shining?" Therefore, language is not a collection of random string together words. Rather, it is systematic, where certain orderings are accepted as having prescribed meanings. The raw materials of each language are the basic sounds.

Sounds (a) give the character of the language; and

(b) form one method of distinguishing different languages.

Phonemes: The term we use for the perceived basic sounds of a language despite the fact that the latitude in pronunciation within a culture may vary; e.g. "IsaleOsi", "Osogbo" in Yoruba. The English language uses 43 phonemes. Certain phonemes are specific to a language. "Th" as "the" in the English language has no equivalent phoneme in French; therefore, the French pronounce it as "Z". Yet another example: "r" is not contained in Japanese. Some African languages contain a glottal click sound. "Gb" in Yoruba is one example. The phonemes do not convey meaning.

Morphemes: They are formed when you put phonetic utterance together. These are the smallest units of a language having a grammatical purpose. They are not necessarily words, as we know them. E.g. in the Word "Plans", there are 2 morphemes – "Plan" and "s". "Plan" is a word, but "s" which serves the useful grammatical function of converting it to its plural form, is not a word as such. Prefixes, suffixes, and word endings which change from singular to plural or alter the tense are therefore morphemes.

Each morpheme has a particular function and the formation of a sentence by combining these morphemes so that they obey rules requires knowledge of grammar. However, it is not enough to be able to combine morphemes in a certain order. The resulting sentence must make sense. This brings us to semantics: the combinations of morphemes to make words and arranging them together to give meaning in a particular tongue. For example, in the sentence: "the green toes fought on the oranges" the grammatical structure is correct, but the sentence is meaningless in many cultures.

8.2 Development of Speech and Language

The development of auditory sensation and perception in children is one of great interest. Experimental studies have been carried out on children at various levels of development.

8.2.1 Developmental Stages of Speech

1. **Reflexive Vocalization:** The 1st month (neonatal) is characterized by nondescript sounds or speech – sounds that cannot be classed. Crying is the most frequent – usefulness – to get attention.

"Pleasure" smiles are also observed. Towards the end of this period, you can differentiate between "discomfort" and "comfort" sounds.

2. **Babbling:** After the 6th week to the 6th month when contended, the child will utter repetitive strings of sounds – "playing with sounds". There seems to be satisfaction at producing, through repeated practice these sounds. At this stage, the baby acquires skill in making sounds.
3. **Lalling:** Repeats sounds from the environment. 6th – 8th months – the child joins his vocalized syllables into repetitive sequences, such as:
   i. ba – ba – ba
   ii. ma – ma – ma
4. **Echolalia:** At around 9-10 months, the child starts to imitate sounds from the environment. He indicates recognition of an object by a vocalization. He uses gestures as substitutes for speech – out stretched hand to be picked up and so on.
5. **True Speech:** This appears around 12-16 months. A child intentionally and correctly uses a conventional sound pattern and anticipates a response. By about one year, many children speak two or three words. They can locate sounds well, know their names, enjoy nursery rhymes and even try to sing. Children at this age enjoy picture books. There is a change from using few words and much babbling and jargon to the use of about a dozen intelligible words. The child can obey simple orders.

At the stage, the child can now talk; he has acquired speech. The main is the qualitative difference between the means of communication of human beings and that in the animal word.

Prenatal Stage

Whether a foetus hears or does not is still an open question. Many have concluded that fetuses respond to loud sounds and that such responses can be conditioned. The auditory mechanism seems to be well developed structurally during later fetal life but in general, the foetus is probably deaf to sounds of normal intensity before birth and during a short period immediately after birth. Strong sounds, however, especially those that can directly pass through the mechanical block, seem to be able to bring about auditory stimulation. A newly born infant is said to be "deaf" for the first 2-3 days, but sounds such as hand clapping could be heard from the 4th day.

Reflection

8.2.2 Learning to Speak

Language development involves the task of:

1. pronouncing words – so that they will be understood. This means developing control over the vocal mechanism;
2. associating meanings with words;
3. building a vocabulary of use-able words for communication; and
4. combining these words into sentences.

Pronunciation: This comes partly from a trial – and – error process but mainly from imitation of a model. Vowel sounds come earlier than consonants.

Types: Mispronunciation is prominent – known as "baby talk"- e.g. "Ki Kit" for biscuit "fister" for "filter", etc. This occurs as a result of

1. omissions of one or more syllables;
2. substitution of letters "dolly" – "tolly";
3. interchanges of letters – "Ki – Kit"- :Biscuit.

8.2.3 Associating Meanings with Words

The next developmental task is to learn that words are associated with objects, people, and activities. Words are labels, that is, they have meaning. If not, it will be "parrot fashion". In the process of conditioning and reinforcement, the child learns to associate words with shapes, sizes, textures, uses, and even sounds.

Vocabulary Building: Next, the baby learns new words as he grows older and new meaning of old words. Growth of vocabulary is very drastic between the ages of 18 months to 6 years.

Table: Growth of Vocabulary: 18 months – 6years

Age	Average Size (in words)
1 year	3 – 4
1½ years	20
2 years	Approximately 200
3 years	Approximately 800
5 years	Approximately 1800
6 years	Approximately 2400

Use of Sentences: From around age 18 months, the child starts one – two word sentences. S/he starts using verbs later. Adjectives follow. When the child approaches age 2 years, more words creep in gradually, with pronouns. Gestures are not abandoned. The child starts to talk volubly. At around age 5, speech usually involves lisping and stuttering. The child wants to get everything out, everything at once. A child comprehends the meanings of what others say more readily than he can put into words to express his own thoughts and feelings. Facial expression and warm voice of the speaker helps.

8.2.4 Delayed Speech Development

Laying a good foundation for speech communication for the child is essential to the social development of the child. Causes of delayed speech vary. Some of them are the following:

1. Poor social environment. A child need to be talked to and encouraged to verbalize.
2. Lack of incentive to talk.

3. Inadequate or defective model.
4. Prolonged illness.
5. Deafness.
6. Multiple births.


Tip

Speech is a special form of communication between people through language to get across our thoughts. A child is a born speaker, and is born into a world of speakers. He has innate capacities. We are born with vocal equipment and neural system, which give us the capacity to verbalize. The sequence is broadly the same in children everywhere.

The ability to vocalize element speech sounds emerges primarily as the result of neuromuscular. However, the child learns to use language for communicating with others, for understanding the speech of others, and for thinking. This means that the process of language acquisition is strongly influenced by environmental conditions and learning. As the language skills of a child improve, his behaviour becomes controlled and regulated by the words of others or by instructions he gives himself. At the outset, language functions primarily as a means of communication. Gradually, it becomes the most important mediator and regulator of behaviour. Behaviour that is learned with the use of language is acquired quickly, is highly stable, and generalizes widely

8.3 Language and Thinking Skills

It is impossible to speak of language without considering thinking skills. Psycholinguists have tried to answer some important questions concerning language thinking relationship. Some of them are:

1. Do we need to have language in order to think or vice versa?
2. Do language and thinking skills grow as separate entities, or are they interconnected from the outset?

Some researchers have argued that thought is language; thinking is manipulating words in the mind. These word-thoughts are regarded as internal speech, which shows up in the sub-vocal movements of human speech organs. The motor action that accompanies reading or thinking declines gradually. However, deaf people do think without vocalizing. This means that thought can occur without the agency of a language system, as we know it. However, some people might still argue that vocalization does not exhaust other features of language. The thinking done by a deaf man is in some language, even in the absence of vocalization.

8.3.1 The Role of Language in Intellectual Development

Speech plays a very important role in human concept formation and intellectual development. Piaget (1963) introduced the notions of Egocentric and socialized speech in pre-school children.

Egocentric speech

At the early stage, the child makes no attempt to adapt speech to the needs of the listener. There is no – attempt to communicate. Properties of the young child's speech – the faulty use of pronouns and demonstrative adjectives, the incorrect ordering of events, the poor expression of causality, the tendency to omit important features and finally, juxtaposition –are all concrete manifestations of the child's egocentrism in speech, that is, his inability to take the other person's point of view. With development, these egocentric manifestations decrease and speech becomes more socialized. The speaker becomes aware of the views of others and adapts his speech accordingly.

Socialized Speech

Egocentric speech disappears around 7 years. Vygotsky, a Russian Psychologist, argued that egocentric speech went underground and became "inner speech". At around 4 or 5 years, the child begins to use internal speech to control and organize his activities. The child thinks words instead of pronouncing. Language "mediates" between external events and the child's response. With an internal linguistic system, the child can represent external events, delay responding to them, and thereby can control his behaviour. Therefore, it is a major factor in the growth of mental structures and concept formation of the child. Socialized Speech has the following characteristics:

1. adapted information, involving an exchange of thought or ideas;
2. criticism of the behaviour or work of others;
3. commands, requests and threats;
4. questions; and
5. answers.

The child speaks to communicate his thoughts to other people, using socialized speech.

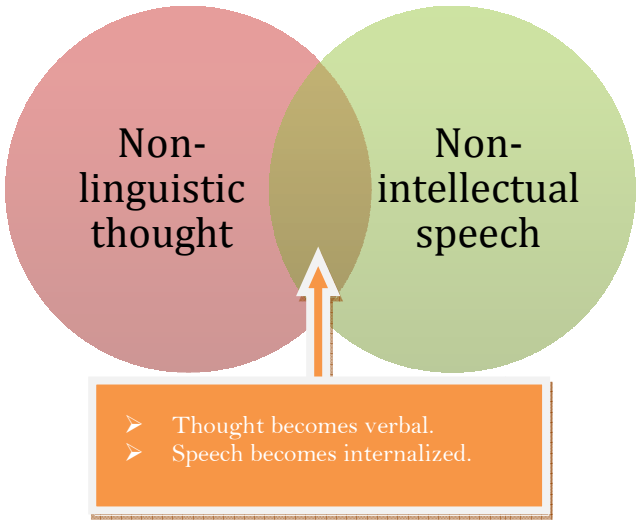


Fig 8.1Pre-linguistic thought

Source: *Pre-intellectual speech (Representative model of Theory relating Thought and Language by Vygotsky, adapted from (197) pg. 172).*

8.3.2 Linguistic Relativity Hypothesis

It is often assumed that language is designed to express thought and that the structure of language must therefore reflect the structure of thought. Whorf (1956) argued that it is possible that the relationship between language and thought is the other way round. Rather than thought limiting language, it may be that language limits thought.

The argument is that the kinds of concepts and perceptions we have are affected by the particular languages we speak. People who speak very different languages perceive the world in very different ways. In other words, thought is relative to the language used to convey it. Language molds the way we think.

The hypothesis cited linguistic evidence based on vocabulary differences. For example, the English language has only one word for snow, while the Eskimo has four. This means that English speakers cannot perceive as many differences in the meaning of snow as Eskimo speakers. Likewise, the Garo language in Burma has different words for various kinds of rice and conditions of rice, husked hand, unhooked, cooked, etc. It can be said that Garo speakers perceive rice better as their language forces them to make subtle distinctions that go unnoticed in English. However, some of the phrases can be cumbersome.

Recent critics of the hypothesis have shown that language embodies distinctions that are important to a culture. It is not language that creates those distinctions. Language does not even limit its speakers to those distinctions. In fact, language depends on the changes in the culture and not the other way round.

Another example is the explanation of cultural variations in colour terms. Striking commonalities were observed in basic colour terms across language. For one, every language takes +its basic colour terms from a restricted set of 10 to 11 names. These are “black”, “white”, “red”, “yellow”, “green”, “blue”, “brown”, “purple”, “pink”, “grey”, and “orange”. No language has less than two (“black” and “white”). It has been shown that perceptions of colour variations are identical though vocabularies differ.

However, the linguistic relativity hypothesis cannot be dismissed too quickly. It calls our attention to one important point. When one has to learn to make fine discriminations in a particular field, it is helpful to have a vocabulary that expresses these discriminations. When we gain expertise in a field, we enlarge our vocabulary for distinctions in that field, that is, the jargons help us to think about and communicate these distinctions. Medicine cannot be practiced without a specialized vocabulary for anatomical parts. It is true that a distinction must exist in someone’s mind before a term can be made up to embody it. Without the term, however, the distinction could not be easily talked about. The jargon of a particular field can often be annoying and sometimes pretentious. However, it plays an important cognitive role.

Study Session Summary

Summary

In this Study Session, we have focused on the subject of language. We discussed the conceptions and basic Moscow, the characteristics of language; the significance of language in human development, developmental stages of speech, and ultimately, examined the theory of linguistic relativity.

Assessment

Assessment

SAQ 8.1

I. What are the two basic requirements for speech to become language?

SAQ 8.2

I. What are the developmental stages of speech?

SAQ 8.3

I. Analyze the different elements of socialized speech.

SAQ 8.4

I. Analyze the Linguistic Relativity Hypothesis.

Feedbacks to Self Assessment Questions (SAQs)

SAQ 1.1

I. In general, learning leads to a change in behaviour. This definition assumes there has to be a measurable parameter before and after the learning process to understand if learning has indeed taken place. One school of thought advocates that experience should serve as this measurable parameter. On the other hand, some other practitioners argue that observable activities and internal processes best serves as measure of change in behaviour. In addition, there is a school of thought that leans in a different direction. Learning, according to this thought, may not translate into a change in behaviour. Therefore, learning may also be viewed as a process that could potentially lead to change in behaviour.

SAQ 1.2

I. Learning by rote is a form of verbal learning that involves memorization of words and patterns from repetition. Cramming is a short-term endeavour to memorize. The difference lies in the relative permanence of change. Rote learning usually leas to long term change.

II. While they share certain similarities concept learning utilizes mental images to identify concepts, paired associates learning uses links to associate words and concepts with other words and concepts.

SAQ 1.3

I. Adaptation could either be by assimilation or accommodation. Assimilation is the process by which new data is integrated into the brain along with previous learning. On the other hand, accommodation involves restructuring the mind to accept new information. It involves modification of previous thought.

II. Classification reflects an ability to observe similarities of features in objects; while conservation reflects the ability to notice how objects appear in different perspectives.

SAQ 2.1

I. The Law of Frequency holds that the strength of a stimulus-response bond is determined by the number of pairings of an unconditioned and conditioned stimulus. On the other hand, the law of recency maintains that the response occurring nearest in time to the stimulus is most likely to be paired with it. Learning occurs because the unconditioned stimulus and conditioned stimulus occur closely and frequently.

SAQ 2.2

I. A) Unconditioned Stimulus; B) Conditioned Stimulus; C) Conditioned Response
II. Unconditioned stimulus is one which does not require prior conditioning in order to evoke a response, that is, it produces the result without any artificial manipulation. On the other hand, conditioned stimulus is one which only produces a response by association with the unconditioned stimulus.

SAQ 2.3

I. The five processes are acquisition, extinction, spontaneous recovery, stimulus generalization, and stimulus discrimination. They all have individual peculiarities.

SAQ 2.4

I. It is assumed that phobic reactions usually develop as a result of some adverse experiences with similar or related situations, in line with the principle of stimulus generalization.

SAQ 2.5

I. Simultaneous conditioning tries to sync both the unconditioned stimulus and the conditioned stimulus. Overshadowing could be a problem because if two stimuli are presented together as a compound conditioned stimulus, then one may dominate or overshadow the other, even though both conditioned stimulus would be perfectly effective if they were presented individually.

SAQ 3.1

1. Edwin Thorndike's methodology tests the thinking ability of a cat utilizing puzzles. He observed that the cat learned by trial and error. He concluded that cats were not thinking since they learned the response gradually and mechanically.
1. Skinnerian conditioning means learning that is a function of change in overt behaviour, that is, a direct product of stimulus and response.

SAQ 3.2

1. The three core features of instrumental conditioning are as follows: Acquisition and retention of instrumental responses as well as the elimination of undefined responses; secondly, it is a voluntary response by an organism; contingency of reinforcement which literally means rewarding a desired behaviour.

SAQ 3.3

I. The principles of operant conditioning includes a number of proceses namely shaping which guides towards desired behaviour through closer and closer approximations; extinction, which involves withdrawing reinforcement if the desired response is achieved; reinforcement which is the stimulus that strengthens or increases the probability of a specific response.

Others include escape, avoidance and punishment. Escape connotes that the subject experiences the aversive stimulus but subsequently gets away from it; avoidance means that an organism responds in a way that keeps an aversive stimulus from being delivered; and punishment is the unpleasant or aversive consequence of undesirable behaviour.
Finally, there is partial reinforcement effect which consists of enforcing some traits and omitting reinforcement in others

SAQ 3.4

I. There are four forms of reinforcement scheduled from which you would have made your consideration, they are: fixed interval, variable interval, fixed ratio and variable ratio. Assuming you are an elementary school teacher, for instance, you might decide to encourage responsible behaviour from the pupils by checking up on them randomly during school hours or only before closing hours.
II. Timing can be an incentive or disincentive to work. Each scheduling pattern has its own limitation. Generally speaking there is the risk that the 'participants' become accustomed to the given pattern and this disincentives them.

SAQ 3.5

I. Operant conditioning may be applied to alter behaviour such as smoking, alcoholism, delinquency, and aggression.

SAQ 3.6

I. Operant conditioning differs from classical conditioning in these three main regards: Identification of stimulus; voluntariness of behaviour; contingent and non-contingent reinforcement.

SAQ 4.1

I. There are three guiding principles and they include the following: Firstly, the observer imitates the model's attractive; secondly, the observer reacts to the way the model is treated and mimics the model's behaviour; thirdly,
II. The four processes involved in observational learning are: attention span, retention processes, motor reproduction processes, and motivational processes; thirdly, making the distinction between an observer acquiring behaviour and performing behaviour.

SAQ 4.2

1. Purposive behaviourism looks at behaviour as directed towards certain goals. In this sense it is appropriate to study observable stimuli and responses.
2. Classical conditioning is a natural process influenced by a conditioned stimulus. Purposive behaviour demonstrates a more voluntary response to stimulus.
3. There are a number of limitations that can be associated with this form of learning not least of which is how effective it may be.

4. The difference between both is the time at which demonstration of learning occurs. Latent learning is less immediate than spontaneous learning.

SAQ 4.3

1. The focal point of the Gestalt theory are Proximity, Similarity, Closure and Simplicity
2. The main factor in grouping under the Gestalt theory is that the whole is greater than the sum

SAQ 5.1

I. The elements that of physical development that affect learner characteristics include physical, intellectual, emotional, and social domains. These are shaped by factors prior schooling, home, culture and community factors. These in turn influence learning through the quality of nteractuin and two-way communication for instance.
II. Motivation ensures commitment to the learning process.
III. Emotions that are important in a person's learning include both positive and negative emotions. Positive emotions include mild curiosity and mild anxiety. Negative emotions include intense anxiety, panic insecurity and rage.

SAQ 5.2

I. Overlearning relates to learning further after complete acquiring acquisition of what needs to be learnt.

SAQ 6.1

I. The evolutionary theories discussed in this material suggest that memory arouses as a response to environmental demands and serves as an adaptive mechanism.
II. Memory is the retention of information in the course of learning and the ability to retrieve that information later. Retention is the storage of information over time. Retrieval, on the other hand, is getting responses out of storage.

SAQ 6.2

I. Retrieval is the process by which previously encoded, stored memories are brought back for current use. The process involves forst locating the stord information; then secondly, returning it to consciousness.
II. Recognition refers to the ability to identify something you have seen before. To recall means to remember something you have previously learned without presently seeing it. Re-learning means a re-study of a material to be learned and learn it again.

SAQ 7.1

I. Your discussion should primarily indicate that thinking is an implicit manifestation of a learning process.

SAQ 7.2

I. By forming the basis of memory images helps to classify and describe new experiences through the process of matching with past ones.
II. Symbols are proxies for something other than themselves.
III. An example would be the Red Cross sign that evokes emergency relief.
IV. The three stages are sensori-motor operations; concrete operations and formal operations. Each of them has a number of phases.

SAQ 8.1

I. It must be systematic and symbolic.

SAQ 8.2

I. The developmental stages of speech are Reflexive vocalization, babbling, lalling, echolalia, and true speech.

SAQ 8.3

I. Socialized speech is a medium through which the child communicates his or her thought too to other people. has the following as main characteristics: adapted information, involving an exchange of thought or ideas; criticism of the behaviour or work of others; commands, requests and threats; questions; and answers.

SAQ 8.4

I. Linguistic Relativity Hypothesis shows that the kinds of concepts and perceptions we have are affected by the particular languages we speak. People who speak very different languages perceive the world in very different ways. In other words, thought is relative to the language used to convey it. Language moulds the way we think.

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