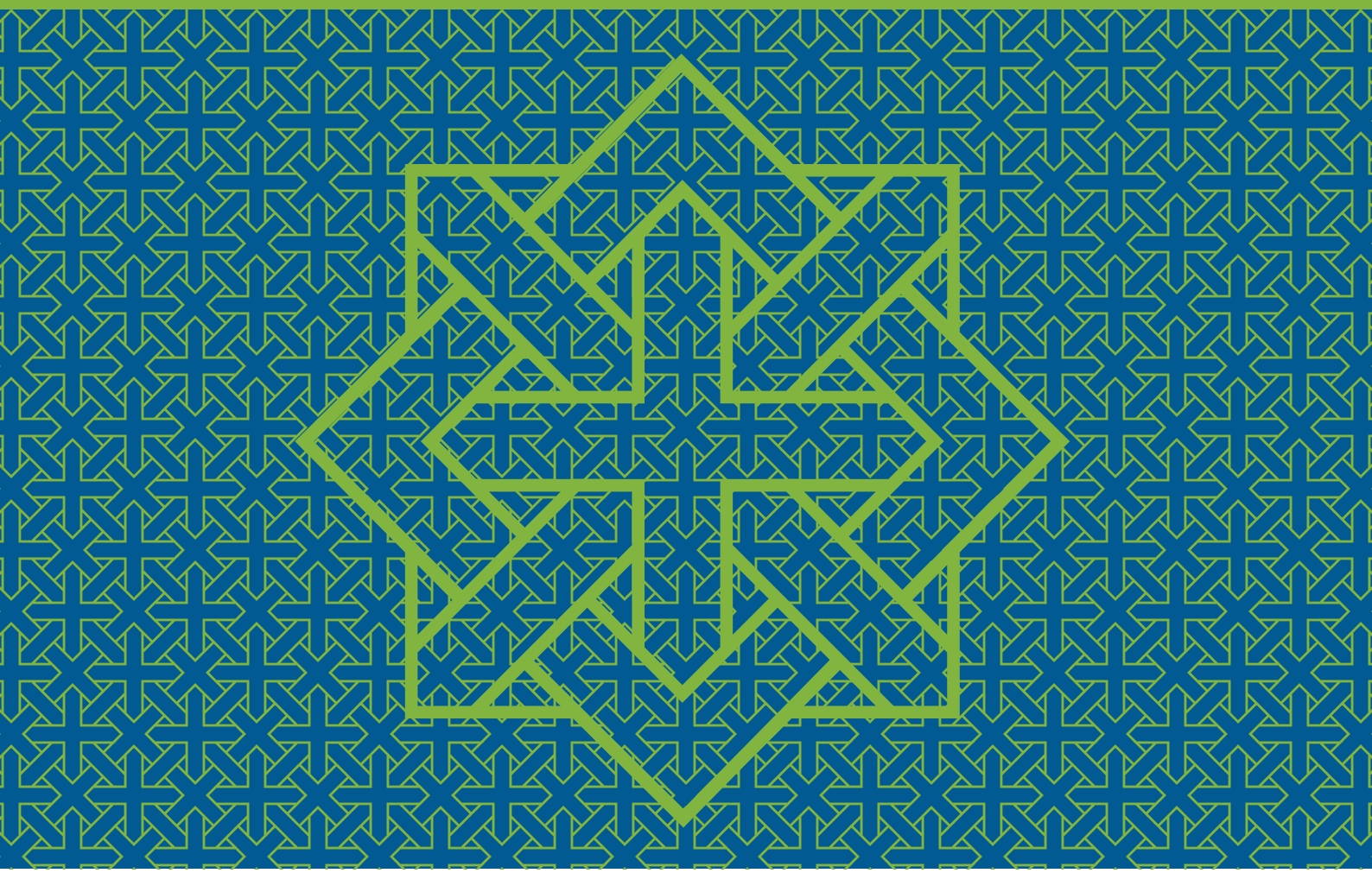
semester 5

Educational Psychology

WINDOWS ON PRACTICE GUIDE

B.Ed. (Hons) Elementary

2012



Higher Education Commission

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Technical Support: Education Development Center (EDC); Teachers College, Columbia University

Higher Education Commission

Foreword

Teacher education in Pakistan is leaping into the future. This updated Scheme of Studies is the latest milestone in a journey that began in earnest in 2006 with the development of a National Curriculum, which was later augmented by the 2008 National Professional Standards for Teachers in Pakistan and the 2010 Curriculum of Education Scheme of Studies. With these foundations in place, the Higher Education Commission (HEC) and the USAID Teacher Education Project engaged faculty across the nation to develop detailed syllabi and course guides for the four-year B.Ed. (Hons) Elementary and the two-year Associate Degree in Education (ADE).

The syllabi and course guides have been reviewed by the National Curriculum Review Committee (NCRC) and the syllabi are approved as the updated Scheme of Studies for the ADE and B.Ed. (Hons) Elementary programmes.

As an educator, I am especially inspired by the creativity and engagement of this updated Scheme of Studies. It offers the potential for a seismic change in how we educate our teachers and ultimately our country's youngsters. Colleges and universities that use programmes like these provide their students with the universally valuable tools of critical thinking, hands-on learning, and collaborative study.

I am grateful to all who have contributed to this exciting process; in particular the faculty and staff from universities, colleges, and provincial institutions who gave freely of their time and expertise for the purpose of preparing teachers with the knowledge, skills, and dispositions required for nurturing students in elementary grades. Their contributions to improving the quality of basic education in Pakistan are incalculable. I would also like to thank the distinguished NCRC members, who helped further enrich the curricula by their recommendations. The generous support received from the United States Agency for International Development (USAID) enabled HEC to draw on technical assistance and subject-matter expertise of the scholars at Education Development Center, Inc., and Teachers College, Columbia University. Together, this partnership has produced a vitally important resource for Pakistan.

PROF. DR. SOHAIL NAQVI
Executive Director
Higher Education Commission
Islamabad

How the Windows on Practice guide was developed

As part of nationwide reforms to improve the quality of teacher education, the Higher Education Commission (HEC), with technical assistance from the USAID Teacher Education Project, engaged faculty across the nation to develop detailed syllabi for courses for the new four-year B.Ed. (Hons) Elementary programme.

The process of designing the syllabus for each course in years 3–4 of the programme began with curriculum design workshops. Deans and directors from universities where these courses will be taught were invited to attend the workshops. The first workshop included national and international subject matter experts who led participants in a seminar focused on a review and update of subject (content) knowledge. The remainder of this workshop was spent reviewing the HEC Scheme of Studies, organizing course content across the semester, developing detailed unit descriptions, and preparing the course syllabi. Although the course syllabi are designed primarily for Student Teachers taking the course, they are useful resources for teacher educators too.

Following the initial workshop, faculty participants developed teaching notes that included ideas for teaching units of studies and related resources. Working individually or in groups, participants focused on their own teaching methods and strategies and how they could be useful to the course's future teachers. Subsequent workshops were held over the course of a year to give faculty sufficient time to complete their work, engage in peer review, and receive critical feedback from national and international consultants. In designing both the syllabi and the teaching notes, faculty and subject matter experts were guided by the National Professional Standards for Teachers in Pakistan (2009).

All of the syllabi developed by faculty who participated in the workshops are included in this document, along with a list of topical teaching notes. Additional references and resources appear at the end of the document. These should provide a rich resource for faculty who will teach this course in the future. Sample syllabi with accompanying teaching notes are also included to provide new Instructors with a model for developing curriculum and planning to teach. This Windows on Practice guide is not intended to provide a complete curriculum with a standard syllabus and fully developed units of study, rather it aims to suggest ideas and resources for Instructors to use in their own planning. Hence, readers will find sample units and materials that reflect the perspective of faculty designers rather than prescriptions for practice.

We are respectful of intellectual property rights and have not included any suggested materials that are copyright protected or for which we have not secured explicit permission to use. Therefore, all materials included may be used in classrooms for educational purposes. Materials in this document are not intended for commercial use, however. They may not be used in other publications without securing permission for their use.

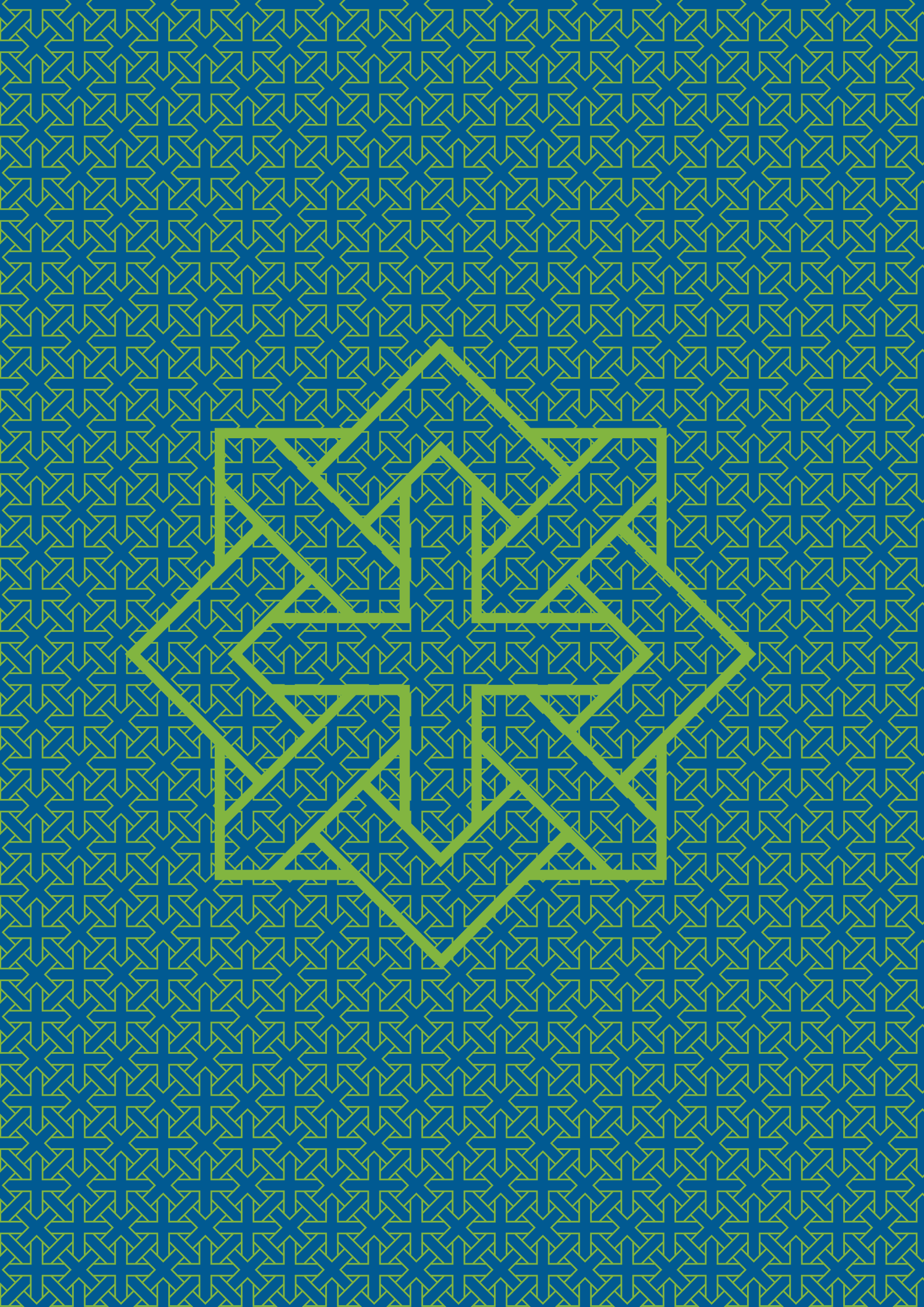
Initial drafts were reviewed by the National Curriculum Review Committee (NCRC) and suggestions were incorporated into final drafts, which were then submitted to the NCRC for approval.

Faculty involved in course design: Abdul Rasool, Shah Abdul Latif University Sindh (SALU), Khairpur; Ameer Bano, Allama Iqbal Open University (AIOU), Islamabad; Dr Amjad Reba, University of Peshawar, Peshawar; Fouzia Ghais, Fatima Jinnah Women University, Rawalpindi; Ismatullah Cheema, University of Education, Lahore; Dr Javed Iqbal, Karakoram International University (KIU), Gilgit; Shahzada Qaiser, University of Education, Lahore; Liaquat, SALU, Khairpur; Liaquat Hussain, Gomal University, DI Khan; Maroof Bin Rauf, University of Karachi, Karachi; Sadaf Naz, Hazara University, Hazara; Sadia Suleman, Sardar Bahadur Khan Women's University (SBKWU), Quetta; Shahzada Qaiser, University of Education, Lahore; Tahira Bibi Naushahi, AIOU, Islamabad; Tarique Bhatti, University of Sindh, Hyderabad; Dr Tehseen Aslam, Institute of Educational Research (IER), University of the Punjab, Lahore

Subject and content specialist leading the seminar: Dr Margaret Jo Shepherd, Professor Emeritus, Teachers College, Columbia University, New York City, USA

Date of NCRC review process: 11–12 January 2013

NCRC reviewers: Dr Mumtaz Akhtar, University of the Punjab, Lahore; M. Asif Malik, Hazara University, Hazara; Fauzia Khurshid, National University of Modern Languages, Islamabad; Nabi Bux Jummani, International Islamic University, Islamabad



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Rationale for a course on educational psychology

Rationale for a course on educational psychology

In the HEC 2010 document, 'Curriculum of Education: B.Ed (Hons.) 4-year Degree Programme', educational psychology was added as a foundation course. The main focus of the educational psychology course is to help Student Teachers develop their understanding of human behaviour and mental processes within an education context. The content of the course will help Student Teachers understand psychological concepts, encourage them to examine their own learning, and show them how to apply these concepts as teachers. The course focuses on acquainting Student Teachers with concepts such as learning, memory, intelligence, and motivation, in order to align their teaching with the psychological needs of students. Student Teachers will review a variety of techniques designed to help students grow as efficient learners.

Common misconceptions about educational psychology

There are many common misconceptions about educational psychology. Some examples include the following:

- People only use 10% of their brains.
- Memory works like a filing cabinet, with facts, audio and video recordings, and other data filed away for later access.
- Some people are 'left brained' and others are 'right brained'.
- Our brain takes in data and processes it logically.
- Learning is a difficult process.
- Learning takes place in a classroom.
- A quiet classroom is the best environment for learning.
- When the teacher or students are done talking about a topic, it has been taught.
- Traditional schooling prepares students for life in the real world.
- Intelligence tests are culturally biased.

Teachers of educational psychology should be wary of these misconceptions. They need to identify and examine their own misconceptions and help Student Teachers do the same. Student Teachers can reflect on, discuss, and test their misconceptions in an attempt to confront them. For example, the common misconceptions listed above can be overcome with the following explanations:

- As far as we know, all parts of our brains are used, although scientists are currently unable to explain all aspects of brain function.

- Memory is particularly complex, and the durability of a memory is dependent on how it processes information, how it is rehearsed, and how similar it is to other information. When recalling information, the brain pieces together data and may even fill in the blanks with a person's own assumptions or prejudices.
- There are some lateralized attributes (i.e. that are focused on one side of the brain), but almost everyone uses both sides of their brain equally. Furthermore, there is no dichotomy between 'logical' and 'creative' people. Some people are adept at logical and creative thinking, some are adept at one but not the other, and some are adept at neither.
- The brain is very active – it plays a role in how a person perceives things and what information is absorbed or ignored. An individual's expectations and prejudices also determine what information is taken in.
- Learning can be difficult, but humans have an impulse to learn. Learning becomes more difficult for some people when they are expected to learn in certain ways.
- Classrooms can be great places for learning, but learning takes place throughout life, everywhere.
- While quiet environments may be helpful at times, most learning takes place in very active circumstances. A quiet classroom is not necessarily always a good educational environment.
- A concept might not have been thoroughly taught until a teacher has fully explained it and students have deeply explored it. Some teachers may even create the conditions for learning without ever saying anything!
- Some students respond to traditional schooling and leave feeling prepared for daily living. Others are unable to make relevant connections between school and life and, thus, leave school unprepared.
- Although a great deal of work has been done on intelligence testing to overcome cultural bias, there are those who still make a strong argument that intelligence tests are heavily weighted in favour of Western culture.

Further details of misconceptions about educational psychology can be found on the following website:

➢ http://www.thedailyriff.com/articles/howard-gardner-shares-his-just-released-97.php

Contributed by Liaquat Hussain, Sadia Suleman, and Dr Javed Iqbal

2

Course syllabi

EDUCATIONAL PSYCHOLOGY

EDUCATIONAL PSYCHOLOGY

This section contains syllabi that have been written by individual faculty or groups of faculty. Using the HEC Scheme of Studies for the course, they considered the balance between the demands of the subject itself, active learning pedagogies, their students, and the particular university milieu in which they work. The syllabi all reflect the same key concepts and broad goals, but they vary in sequence and emphasis.

SYLLABUS 1

Prepared by
Liaquat Hussain, Sadia Suleman, and Dr Javed Iqbal

Year, semester
Year 3, Semester 5

Credit hours
3 credits (48 contact hours)

Prerequisite
Successful completion of Child Development course

Course description

This course is an introduction to educational psychology that covers the basic concepts, theories, and principles of human development, learning, motivation, individual differences, intelligence, and assessment. Additionally, it relates how these concepts are applied to classroom teaching. In an educational setting, it is essential for teachers to know about human development and how students learn. Students learn according to their own pace and ability, so concepts about individual differences and different types of learners are also covered.

Learning outcomes

At the end of this course, Student Teachers will be able to:

- describe different schools of thought and differentiate between psychology and educational psychology
- define learning and explain different theories of learning and their application in the classroom
- categorize individual differences based on physical, intellectual, emotional, and socio-cultural differences.
- analyse the concept and theories of motivation
- analyse the impact of educational psychology on the processes of teaching and learning.

Essential questions

- Why do we behave the way we do?
- How can knowing and understanding research help shape effective teaching practice?
- Can educational psychology inform teaching?
- What is good teaching and how is it recognized?

Main ideas

- Knowledge is actively and socially constructed by each person in light of and in relation to past experiences, the context of learning, personal motivation, and personal beliefs, attitudes, and prior knowledge.
- We have learned how the human mind functions, yet we do not yet know how people learn.
- Cognitive psychologists' understanding of the learning process of school-aged children is constantly evolving.
- It is the learners who learn.
- Metacognition, simply put, is learning about learning. More specifically, it is about knowing who we are as learners and developing the capacity to leverage our strengths to our advantage.
- Educational psychology applies the psychological principles that underlie learning in both formal and informal educational settings.

Learning and teaching approaches

A major portion of the course will be taught using an interactive, student-centred teaching approach through the following methods:

- inquiry content and process
- discussion
- cooperative learning strategies (e.g. jigsaw, readings, group work, mind mapping, and think, pair, share)
- question and answer
- text-against-text
- interactive lectures.

Unit 1: Basics of educational psychology

This course focuses on teaching and the theories educational psychology offers about how we learn. Unit 1 examines different theories and how each can be applied to classroom practice. This unit is designed to help Student Teachers identify which theory is appropriate for their needs and which theory to apply when evaluating instructional programmes.

Learning outcomes

At the end of this unit, Student Teachers will be able to:

- differentiate between psychology and educational psychology
- explain different schools of thought, such as behaviourism, cognitivism, and humanism, and the implication of each for on teaching and learning
- explain the advantages and disadvantages of each approach
- consider and successfully integrate aspects of different approaches in their teaching practice.

Unit 2: Learning process

Unit 2 explores complex questions about how students learn, how human beings use their senses to interact with the environment, how information is processed, and how individuals would cope in different life situations if their basis of learning were removed. Student Teachers will also examine how people have tried to answer these questions using different theories of motivation. This unit is not confined to classroom learning; it will consider how learned material is applied to real-life situations.

Learning outcomes

At the end of this unit, Student Teachers will be able to:

- demonstrate their understanding of different learning theories
- compare different learning theories and identify their own theories of learning
- critique and justify which theories are best suited for students' individual differences.

Unit 3: Individual differences

Unit 3 focuses on individual differences among students. Teachers interact with a large number of students who are not only physically different, but have mental, social, cultural, and emotional differences. Therefore, teachers must be aware of the differences in their students in order to teach effectively.

Learning outcomes

At the end of this unit, Student Teachers will be able to:

- recognize individual differences in approaches to learning
- identify teaching methods that impact individual learning
- analyse varied student abilities and plan their teaching accordingly
- assess their own confidence to teach students with special needs.

Unit 4: Motivation

Unit 4 examines human motivation. Psychologists who study motivation note that an infant is driven by biological needs. However, other motivations appear as the child interacts with other people and the environment. These psychological motives are classified by different theorists, including Maslow, a psychologist studied in this course who developed a needs theory to explain the interactions between people and their physical, social, and emotional environment.

Learning outcomes

At the end of this unit, Student Teachers will be able to:

- identify how learning and motivation are shaped by social contexts in homes, school, and communities
- analyse the implications of Maslow's theory of motivation on Student Teachers' teaching
- identify success seekers and failure avoiders in their own classrooms.

Weekly distribution of course content

1 UNIT 1:	Basics of educational psychology
Weeks 1–4	Content
1	The nature of educational psychology The scope of educational psychology The differences between psychology and educational psychology
2	Conceptual approaches to psychology Structuralism and functionalism Cognitivism
3	Behaviourist theory Humanistic theory Constructivist theory
4	Gestalt psychology Psychoanalysis Why do we study educational psychology?

2 UNIT 2:	Learning process
Weeks 5–9	Content
5	The definition of learning How do we learn?
6	Learning theories Behaviourist theory and a critique of its use in the classroom
7	Cognitive theory and a critique of its use in the classroom Social learning theory and a critique of its use in the classroom
8	Constructivist theory and a critique of its use in the classroom Brain-based learning and a critique of its use in the classroom
9	Transfer of learning Factors affecting learning

3 UNIT 3:	Individual differences
Weeks 10–13	Content
10	The concept of individual differences How do people differ?
11	Why do people differ? An overview of physical, emotional, social, and mental differences How to deal with individual differences
12	Children with special needs Physical disabilities
13	Learning disabilities Emotional disturbance Social and economic disadvantages Gifted learners

4 UNIT 4:	Motivation
Weeks 14–15	Content
14	Needs and drives Basic and acquired motives
15	How is a child motivated? Techniques of motivation
16	Classification of human motives: Maslow's need theory Psychoanalytic theory Kohn's motivational theory

Assessment techniques

A variety of assessment techniques will be used. Internal evaluation will account for 40% of marks and include assignments (10%), presentations (10%), and tests (20%).

External evaluation (essays and objective tests) will account for 60% of marks and include an objective portion (20%) and an essay portion (40%).

Grading policy

University grading policy, the details of which will be provided in class, will be followed.

Textbooks and references

The course will draw on textbooks, journal articles, and websites. A list of these will be distributed in class.

Resources

The following resources may be helpful for choosing appropriate readings. You may include your chosen list of readings on the syllabus or distribute it in class. However, readings should include only those resources that you expect students to use throughout the course. Other readings should be distributed as they are needed. Identify specific chapters from recommended books.

Printed materials

Elliott, S. N., Kratockwill, T. R., Cook, J. L., & Travers J. F. (2000). *Educational Psychology: Effective Teaching, Effective Learning* (3rd ed.). New York: McGraw-Hill.

➢ Available at http://www.mhhe.com/socscience/education/elliott/book/today.htm

Felder, R. M., & Brent, R. (2005). Understanding Student Differences. *Journal of Engineering Education*, 9, 57–72.

➢ Available at http://eprints.me.psu.ac.th/ILS/info/Understanding_Differences.pdf

The following link connects to a resource on the importance of individual differences among children. It offers both practical examples of how teachers can help students by creating effective learning environments and related activities. This resource was developed for B.Ed. students by Asia e University.

➢ http://peoplelearn.homestead.com/BEduc/Chapter_7.pdf

Websites

This website gives foundational information on learning theories and provides examples of how school teachers can integrate each theory of learning into a lesson plan. It is a useful resource for both Student Teachers and Instructors.

- http://web.utk.edu/~rmcneele/classroom/theories.html

This chapter centres on three concepts: Bloom's Taxonomy, multiple intelligences and learning modalities, and memory theory. It provides a solid foundation that can help Student Teachers hone their lesson planning and instructional skills.

- http://teachingasleadership.org/sites/default/files/Related-Readings/LT_Ch1_2011.pdf

Dr C. George Boeree gives a short biography on Abraham Maslow and outlines his theory of personality development. The article critically discusses the limitations and strengths of the theory in simple language. This is a suitable reading for Student Teachers.

- http://webspace.ship.edu/cgboer/maslow.html

This website offers lecture notes on 14 topics, including cognitive theories, individual differences, assessments, standardized testing, motivation, and classroom management. It is a rich resource for teachers.

- http://www2.raritanval.edu/departments/HumanitiesSocSci/Part-Time/Wolfe/edpsych/notes.html

Select the 'Educational Psychology' link on the left-hand menu of this site to find topical lecture notes on 16 topics as well as study guides. The notes offer teachers a brief summary of theories and concepts in educational psychology. The materials are all in Word, so they are easy to access.

- http://www.karencrawfordphd.com/default.asp

The International Academy of Education website features this booklet by Monique Boekaerts, the 10th in the Educational Practice series on improving learning. It provides information on motivation and learning, and explains principles that encourage children to learn.

- http://www.ibe.unesco.org/fileadmin/user_upload/archive/publications/EducationalPracticesSeriesPdf/prac10e.pdf

Notes on resources for lectures

This page has a helpful discussion on teaching psychology, including how to vary teaching techniques.

- http://www.ehow.com/how_4422139_teach-psychology-class.html

On this website, Marcia L. Conner offers a concise description of the major theories covered in this syllabus.

- http://www.coitweb.uncc.edu/~dcassidy/A%20Primer%20on%20Educational%20Psychology.htm

SYLLABUS 2

Prepared by
Tarique Bhatti and Maroof Bin Rauf

Year, semester
Year 3, semester 5

Credit value
3 credits (48 contact hours)

Prerequisite
Successful completion of Child Development course

Course description

This course is designed to provide Student Teachers with up-to-date information on educational psychology and its application in the teaching and learning processes. This course will provide an opportunity for Student Teachers to develop an understanding of different concepts and principles of educational psychological and to analyse their application through readings, discussions, and small projects.

Student Teachers will develop a working knowledge of theories of educational psychology based on varying viewpoints and developmental influences and that provide guidance on practical application and teaching methods. They will study ways to approach the learning process, intelligence, motivation, and learning difficulties of students in an educational context.

Learning outcomes

At the end of this course, Student Teachers will be able to:

- demonstrate their understanding of the concept of educational psychology and its implication for educational practices
- apply learning principles to their teaching to help students maximize their learning
- compare various theories of learning and human learning capabilities
- analyse the role of motivation theories and principles in their instructional activities
- understand various concepts of intelligence and apply this understanding in monitoring class performance of their students.

Main idea
During curriculum planning and design, the role of the learner and the learning process must be considered.

Unit 1: Understanding educational psychology

In this unit, Student Teachers will explore various schools of thought throughout the history of educational psychology as well as educational psychology's nature, scope, and impact on classroom practices.

Essential questions

- What do we study in educational psychology?
- Why is it important for a Student Teacher to study educational psychology?
- How do theories and knowledge of educational psychology apply to daily classroom practices?

Skills to be practised by Student Teachers

- Reading
- Analysing
- Describing
- Classifying
- Categorizing
- Synthesizing
- Decision-making
- Critical thinking

Activities in which Student Teachers will be engaged

- Discussions
- Role plays
- Case study analyses

Modes of assessment

- Quizzes
- Group work to define educational psychology
- Written tasks

Unit 2: Intelligence and individual differences

In this unit, Student Teachers will explore the concept of intelligence in an educational context. This unit will include an analysis of the theory of multiple intelligences and identify approaches to address the specific needs of learners. Because multiple intelligences theory has been challenged by research, critiques of the theory will be considered. Individual differences will be discussed with regard to diversity in our surroundings.

Essential questions

- Why do we study intelligences and individual differences?
- To help them develop intelligence, how can we address the needs of individual learners?

Skills to be practised by Student Teachers

- Reflecting
- Analysing
- Engaging in interactive discussions

Activities in which Student Teachers will be engaged

- Discussions
- Role plays
- Presentations (e.g. PowerPoint, video clips) on individual differences
- Case studies
- Socratic questioning

Modes of assessment

- Assignments
- Weekly reflection
- Group presentations
- Minor research tasks

Unit 3: Learning

This unit will help Student Teachers explore different learning theories and analyse their application in the teaching and learning processes.

Essential questions

- Why is the concept of learning essential for teachers?
- How can teachers enhance student learning in different areas?
- How does knowledge of learning theories help teachers enhance the process of teaching?

Skills to be practised by Student Teachers

- Analysing
- Describing
- Critical thinking

Modes of assessment

- Presentation on different learning theories
- Unit reviews
- Tests
- Midterm exams

Unit 4: Motivation

The unit will help Student Teachers investigate the relationship between motivation and student learning. Student Teachers will analyse different theories of motivation and explore the effect of motivation on their teaching.

Essential questions

- Why is motivation so important?
- What are the different types of motivation that facilitate effective learning?

Skills to be practised by Student Teachers

- Describing
- Analysing

Activities in which Student Teachers will be engaged

- Interactive lectures
- Case studies
- Role plays
- Socratic questioning
- Presentations (e.g. PowerPoint)

Modes of assessment

- Written assignments
- Midterm exams

Unit 5: Learning difficulties and disabilities

This unit will explore the difference between learning difficulties and disabilities and how this knowledge can help teachers facilitate learning.

Essential questions

- Why is it essential for teachers to study learning disabilities and learning difficulties?
- How does an understanding of learning difficulties help teachers to facilitate learning?

Skills to be practised by Student Teachers

- Describing
- Interpreting
- Explaining
- Resolving case studies

Activities in which Student Teachers will be engaged

- Interactive lectures
- Focused readings
- Interactive discussions
- Case studies
- Role plays
- Small-group discussions

Modes of assessment

- Written assignments
- Group presentations

Weekly distribution of course content

1 UNIT 1:	**Understanding educational psychology**
Weeks	Content
1–4	Definitions, meaning, objectives, and scope of educational psychology Educational psychology methods and techniques Recent developments in educational psychology

2 UNIT 2:	Intelligence and individual differences
Weeks	Content
5–7	Defining intelligence The meaning of intelligence Intelligence as a process Approaches to intelligence Multiple intelligences Diversity, individual differences, and working memory

3 UNIT 3:	Learning
Weeks	Content
8–11	Historical perspectives on learning Six schools of educational psychology • Psychoanalytic • Behavioural • Cognitive (and information processing) • Humanistic • Social constructivist • Cognitive constructivist Application of theory to education

4 UNIT 4:	Motivation
Weeks	Content
12–13	Motivation Types of motivation • Maslow's theory of motivation • Weiner's attribution theory Implication for educators Other strategies of how to help motivate learners

5 UNIT 5:	Learning difficulties and disabilities
Weeks	Content
14–16	Learning difficulties and disabilities Signs and symptoms of learning disabilities and disorders Helping children with learning difficulties

Major assignments

At the end of this course, Student Teachers will be required to submit their weekly reflections in a journal that documents their responses to the course content. Reflections will be evaluated on the basis of what Student Teachers have learned and how their learning can be used effectively in the classroom. The journal will account for 10% of the final grade.

Grading policy

University grading policy, the details of which will be provided in class, will be followed.

Textbooks and references

The course will draw on textbooks, journal articles, and websites. A list of these will be distributed in class.

Resources

The following resources may be helpful for choosing appropriate readings. You may include your chosen list of readings on the syllabus or distribute it in class. However, readings should include only those resources that you expect Student Teachers to use throughout the course. Other readings should be distributed as they are needed. Identify specific chapters from recommended books.

Coon, D., & Mitterer, J. O. (2007). *Introduction to Psychology: Gateways to Mind and Behavior.* Melbourne: Wadsworth.

Dash, N., & Dash, B. N. (2004). *A Textbook of Educational Psychology* (4th ed.). New Delhi: Shipra Publications.

Mangal, S. K. (2007). *Advanced Educational Psychology* (2nd ed.). New Delhi: Prentice Hall of India.

Plotnik, R. (2005). *Introduction to Psychology* (7th ed.). Melbourne: Wadsworth.

Santrock, J. W. (2004). *Life Span Development* (9th ed.). Boston: McGraw-Hill.

Woolfolk, A. E. (2010). *Educational Psychology* (11th ed.). Boston: Allyn & Bacon.

SYLLABUS 3

Prepared by
Abdul Rasool and Liaquat

Year, semester
Year 3, semester 5

Credit value
3 credits (48 contact hours)

Prerequisites
Successful completion of semesters 1–4

Course description

This course is designed to help Student Teachers understand the essential components of human behaviour and their application in the teaching and learning processes. The course will provide Student Teachers with an opportunity to explore various theories about cognitive, social, and moral development. It will also cover how different schools of thought approach psychology, in particular educational psychology, intelligence, and memory in relation to education. The implication of different teaching and learning processes on education and the importance of using interactive and learner-centred approaches will be emphasized.

Course outcomes

At the end of this course, Student Teachers will be able to:

- apply learning theories to classroom teaching
- analyse the process of teaching and learning based on educational psychology principles
- use various principles and theories of motivation in classroom teaching
- demonstrate their understanding of various methods that promote effective and long-term learning.

Learning and teaching approaches

A variety of teaching and learning approaches will be used throughout this course, including:

- lectures and demonstrations (traditional and interactive)
- self-reflection and self-analysis
- group discussions
- group activities
- case studies
- role plays.

Semester outline

Unit 1: Introduction to educational psychology (3 weeks)

Unit 1 provides an overview of the dominant educational psychology principles and concepts and how they apply in an educational context. Student Teachers will explore goals of educational psychology, its implications in an educational context, its scope, and its importance in the teaching and learning processes.

Unit 2: Learning (5 weeks)

Unit 2 will provide an overview of laws and theories of learning and learning difficulties in the context of principles of educational psychology. Emphasis will be placed on the nature of diverse learners in different contexts, and techniques and strategies to cope with challenging situations in the classroom will be offered.

Unit 3: Motivation (3 weeks)

Unit 3 will focus on the principles and theories of motivation related to the behavioural, cognitive, and social perspectives of educational psychology. This unit will equip Student Teachers with a better understanding of the processes involved in teaching and learning and the interactions between teacher and student.

Unit 4: Memory (1 week)

Unit 4 explores the concept of memory and aims to help Student Teachers develop an understanding of the role of memory and forgetting in the learning process. This unit will also enable Student Teachers to adapt some techniques to promote long-term memory practices. Application of such practices in the field of education will be emphasized.

Unit 5: Intelligence (1 week)

Unit 5 will provide an overview of the concept of intelligence, its types and theories, and its application in an educational context.

Weekly distribution of course content

1 UNIT 1:	**Introduction to educational psychology**
Weeks 1–3	Content
1	Definition of psychology The importance of educational psychology
2	Goals of psychology
3	Schools of psychology (biological, cognitive, behavioural, psychoanalytic, humanistic) The implications of educational psychology

2 UNIT 2:	**Learning**
Weeks 4–8	Content
4	Definition of learning
5	Theories of learning (classical and operant conditioning)
6–7	Theories of learning (social, constructivist, and cognitive)
8	Learning difficulties (dyslexia and attention deficit hyperactivity disorder) The learning process

3 UNIT 3:	**Motivation**
Weeks 9–11	Content
	Definition of motivation Types (intrinsic and extrinsic) Five general approaches to motivation Self-perception Theory of motivation (Maslow's hierarchy)

4 UNIT 4:	Memory
Weeks 12–14	Content
	Definition of memory Types of memory The processes of memory and forgetting Application in an educational context

5 UNIT 5:	Intelligence; Exam
Weeks 15–16	Content
15	Concept of intelligence Theories of intelligence • Howard Gardner's multiple intelligences theory • Sternberg's triarchic theory • John Fisher's personal construct psychology • Charles Spearman's general intelligence theory
16	Final exam

Grading policy

University grading policy, the details of which will be provided in class, will be followed.

Textbooks and references

The course will draw on textbooks, journal articles, and websites. A list of these will be distributed in class.

SYLLABUS 4

Prepared by

Ismatullah Cheema, Shazada Qaiser, Ameer Bano, Tahira Bibi, and Dr Tehseen Aslam

Year, semester

Year 3, semester 5

Credit value

3 credits (48 contact hours)

Prerequisite

Successful completion of Child Development course

Course description

The enrolment rate in primary education in Pakistan is low, and the dropout rate is very high. One explanation for the high dropout rate is that teachers have difficulty understanding and responding to the learning problems of children from diverse backgrounds and their behaviours at various stages of development. The course is designed to help Student Teachers conceptualize and apply psychological principles that underlie learning in their classroom practice in order to improve the learning outcomes of all children. It will emphasize improving practices that promote the emotional well-being of students, based on a theoretical understanding of psychological concepts. Student Teachers will also have an opportunity to consolidate their understanding of the content covered in their Child Development course. The principles and concepts introduced in educational psychology will help Student Teachers professionally handle problems relating to the teaching-learning process.

Course outcomes

After completing this course, Student Teachers will be able to:

- explain key concepts used in educational psychology
- use students' abilities to promote their cognitive development effectively
- identify and use students' self-concept and self-esteem to help them perform effectively both in and out of school
- identify and apply strategies that promote good relationships between teachers and students
- interpret and critique the role of Gardner's theory of multiple intelligences in the teaching-learning process
- prepare an action plan for using motivational techniques.

Teaching and learning approaches

A variety of teaching and learning strategies will be used to promote active learning, including mini-lectures, small-group discussions, case study analysis, problem-solving exercises, simulated planning exercises, and presentations.

Unit 1: Understanding educational psychology

Unit 1 explores the difference between psychology and educational psychology and the latter's significance in classroom practices. Educational psychology can be understood as the study of learners, learning, and teaching, all subsumed under the heading 'educational psychology'. This definition can be expanded to include the knowledge, wisdom, and everyday theory that all teachers require in their classroom practices.

Learning outcomes

At the end of the unit, Student Teachers will be able to:

- explain key concepts in educational psychology
- trace the roots of educational psychology
- identify teaching styles that promote active learning and incorporate them into their teaching-learning process
- explain the role of educational psychology in making the teaching-learning process effective.

Weekly distribution of course content

1 UNIT 1:	**Understanding educational psychology**
Week	Content
1	Educational psychology What is psychology? What is education? What is educational psychology? Historical perspectives on educational psychology
2	Teaching and learning processes What is teaching? Qualities of a good teacher The role of the teacher • Teachers' role as facilitator in promoting healthy teacher–student interactions • Teaching perspective and instructional decision-making • Decision-making within the system
3	The importance of educational psychology Teaching and learning processes Applying psychological principles in teaching and learning

Unit 2: Learning

Unit 2 will explore different theories of learning that attempt to explain the learning process of children, with a key focus on constructivist theory of learning. Student Teachers are assumed to have completed the Child Development course, and it is assumed they will understand how students learn at different stages of their mental and physical development. This unit also explains how teachers can apply these theories to promote learning in their classrooms.

Learning outcomes

At the end of the unit, Student Teachers will be able to:

- define *learning* broadly
- demonstrate understanding of different theoretical perspectives of student learning
- apply learning theories to bring about conceptual change in students.

Weekly distribution of course content

2 UNIT 2:	**Learning**
Week	Content
4	Learning: An orientation Definition of learning Learning processes Type of learning
5–6	Gestalt views of learning Concept of Gestalt learning Organizational principle Socio-cognition perspective Cognitive learning view Bandera's perspective
7–9	Constructive learning view Discovery learning Expository learning Cooperative learning Conditions of learning Educational implications of the constructive learning view

Unit 3: Individual differences and intelligence

Unit 3 will investigate how to incorporate Gardner's theory of multiple intelligences into teaching. Student Teachers will compare and contrast the ways in which students from various cultures and ethnic groups are alike and different and then identify the implications of these differences for classroom practice. Student Teachers will similarly compare and contrast male and female students and identify what can be done to provide equitable educational opportunities for both genders.

Learning outcomes

At the end of the unit, Student Teachers will be able to:

- discuss the concept of intelligence
- compare and contrast individual differences among students and reasons for these differences
- identify and apply theories of intelligence during classroom teaching
- explore methods of creativity and utilize them in the process of teaching and learning
- explain learning styles of students based on theories learned in the unit.

Weekly distribution of course content

3 UNIT 3:	**Individual differences and intelligence**
Week	Content
10	Individual differences Definition of individual differences Areas of individual differences Educational provisions for meeting individual variation
11–12	Intelligence Definition of intelligence Theories of intelligence Use in education Creativity Learning styles Types of learning styles Educational implications of learning styles

Unit 4: Motivation

Unit 4 explores how teachers and parents provide motivation, help children become aware of their own needs, and inspire them in such a way that children willingly and eagerly involve themselves in certain activities to meet those needs. Student Teachers will learn to describe the functional sources of motivation, explain its role in the learning process, compare and contrast intrinsic and extrinsic motivation, and explain how the basic human needs for self-worth and relatedness influence motivation. Additionally this unit describes the role played by emotion in learning.

Learning outcomes

At the end of the unit, Student Teachers will be able to:

- identify the importance and functions of motivation in student learning behaviours
- compare and analyse the role of intrinsic and extrinsic motivation in student learning
- apply major theories of motivation in a classroom context
- implement effective techniques and strategies of motivation during classroom teaching.

Weekly distribution of course content

4 UNIT 4:	**Motivation**
Week	Content
14	Introduction to motivation The importance and function of motivation Intrinsic motivation and extrinsic motivation
15–16	Theories of motivation Content theories of motivation Process theories of motivation Reinforcement theories of motivation

Grading policy

University grading policy, the details of which will be provided in class, will be followed.

Textbooks and references

The course will draw on textbooks, journal articles, and websites. A list of these will be distributed in class.

Resources

The following resources may be helpful to you in choosing appropriate readings. You may include your chosen list of readings on the syllabus or distribute it in class. However, readings should include only those resources that you expect students to use throughout the course. Other readings should be distributed as needed. Identify specific chapters from recommended books.

Unit 1

O'Donnell, A., Levee, J., & Smith, J. (2012). *Educational Psychology: Reflection for Action* (3rd ed.). Hoboken, NJ: John Wiley.

Rubie-Davies, C. M. (ed.) (2011). *Educational Psychology: Concepts, Research, and Challenges*. New York: Routledge.

Unit 2

Beard, C., & Wilson, J. P. (2006). *Experiential Learning: A Best Practice Handbook for Educators and Trainers* (2nd ed.). London: Kogan Page.

Schunk, D. H. (2011). *Learning Theories: An Educational Perspective* (5th ed.). New Delhi: Dorling Kindersley.

Illeris, K. (ed.) (2009). *Contemporary Theories of Learning: Learning Theories…in Their Words.* New York: Routledge.

Unit 3

Chamorro-Premuzic, T. (2011). *Personality and Individual Differences.* London: Wiley.

Maltby, J., Macaskill, A., & Day, L. (2010). *Personality, Individual Differences and Intelligence* (2nd ed.). Sheffield: Prentice-Hall.

Haslam, N. (2007). *Introduction to Personality and Intelligence*. London: SAGE.

Unit 4

Gilbert, I. (2013). *Essential Motivation in the Classroom* (2nd ed.) Abingdon, UK: Routledge.

Wiseman, D. G., & Hunt, G. H. (2008). *Best Practice in Motivation and Management in the Classroom*. Springfield, IL: Charles C Thomas.

3

Representative syllabi with teaching notes

This section contains two syllabi, each with accompanying teaching notes. The Integrated Teaching Notes section offers additional notes that have been integrated using broad themes addressed in the course. Faculty who are teaching the course for the first time or who are interested the process of curriculum design may find it useful to see how the authors of these representative syllabi chose to develop particular ideas and themes in their notes. (Ideas presented here differ from those in the Integrated Teaching Notes, where integrated themes may be found.)

REPRESENTATIVE SYLLABUS 1

Year, semester

Year 3, semester 5

Credit value

3 credits (48 contact hours)

Prerequisite

Successful completion of semesters 1–4

Course description

Educational Psychology is a compulsory course in the B.Ed. (Hons) programme. It is designed to provide an in-depth understanding of the central ideas of educational psychology.

As an interdisciplinary blend of psychology and education, educational psychology addresses both theoretical and practical issues. It investigates the science of human behaviour, especially behaviour connected to teaching and learning. Student Teachers will consider how theoretical and empirical knowledge about different aspects of educational psychology can be applied to educational settings. In particular, the focus will be on the practice of the core principles of learning, their uses in understanding the learning and behaviour of students, and the application of these principles to classroom practices.

Additionally, Student Teachers will learn about the perspectives of different educational psychologists with regard to the cognitive, social, and moral development of individuals. Student Teachers will study the concept and theories of intelligence, the theory of multiple intelligences, personality, and motivation. This course also includes different psychological testing tools and attitude measurement scales along with guidance and counselling in educational settings.

Course outcomes

After completing this course, Student Teachers will be able to:

- analyse the nature of educational psychology and its importance in the context of education
- discuss theoretical perspectives that can be used to explain learning and different attributes of learners including intelligence, motivation, and personality
- explore the nature of memory and creativity
- identify strategies to develop critical thinking among learners
- identify components of metacognition and explore how teachers can promote this behaviour in their students
- recognize characteristics of psychological testing and assessment techniques related to attitude, interest, and personality traits.

Learning and teaching approaches

Different interactive strategies will be applied to teach the course content. These strategies include discussions, debates, case studies, and questioning, all of which promote creativity, critical and analytical skills, and cooperation. Moreover, independent learning will be encouraged through in-class and homework assignments involving use of the library and technology. Supportive reading materials will be provided to Student Teachers at the start of the course so that they develop the habit of reading before class. This will enable them to raise the level of in-class discussion and make the course more dynamic. Various approaches and strategies will be employed to help Student Teachers reflect on how their learning can be applied in their own classrooms.

Unit 1: Introduction to educational psychology

Both artistry and knowledge of the principles of instruction are considered essential to becoming an effective teacher. Educational psychology offers many principles upon which teachers can draw. The core principles of educational psychology are drawn from both basic and applied research, with a specific focus on how people learn. Unit 1 sets the foundation of the course – Student Teachers will be introduced to the course's sub-themes and apply them in a classroom setting by identifying psychological problems in both teaching and learning.

Duration: 3 weeks (9 hours)

Learning outcomes

After completing this unit, Student Teachers will be able to:

- describe and explain different perspectives on educational psychology
- explain the scope and importance of educational psychology
- identify branches of educational psychology
- relate educational psychology with other disciplines.

1 UNIT 1:	Introduction of educational psychology
Week	Content
1	Introduction to the course: Learning expectations, course assessment, and grading The meaning and concepts of educational psychology Principles of educational psychology
2	The scope of educational psychology in the classroom Applying educational psychology in the classroom
3	Branches of educational psychology The relationship between educational psychology and other disciplines

Teaching methodologies

- Interactive lectures
- Brainstorming (individuals and groups)
- Think, pair, share activities
- Question and answer
- Discussions
- Role play

Unit 2: Learner development

Unit 2 will enhance Student Teachers' cognitive development, to reason, to think, and to be moral and responsible citizens. It is commonly understood that each human act occurs in response to a problem, but there is great variation in the solutions people devise. Some solutions are better than the others, so students should be taught effective problem-solving skills. Related cognitive functions, particularly creativity and how creativity can be developed among all learners, will be discussed. Self-concept, morality, and motivation of learners will also be explored. Student Teachers will be introduced to the factors that cause students' moral reasoning and behaviour to change over time and what teachers can do to promote moral development.

Duration: 3 weeks (9 hours)

Learning outcomes

After completing this unit, Student Teachers will be able to:

- analyse the impact of home, family, school, and teacher on social development of students
- recognize the role of creativity and critical thinking in the development of a learner
- discuss moral and ethical values and their effect on a learner's development.

2 UNIT 2:	**Learning development**
Week	Content
4	Home and family as a factor in social development School and teacher as a factor in social development
5	Critical thinking Creativity Assessing creativity Creativity in the classroom
6	Lawrence Kohlberg's theory of moral development

Teaching methodologies

- Interactive lectures
- Jigsaw technique
- Group discussions
- Handouts

Unit 3: Learning theories and their application

Unit 3 explores various theoretical perspectives on student learning. Specific topics will include different theories of learning, how modelling can be used to facilitate learning, the role played by self-efficacy in learning, and how teachers can use modelling and students' self-efficacy to enhance learning.

Duration: 3 weeks (9 hours)

Learning outcomes

After completing this unit, Student Teachers will be able to:

- understand various perspectives on learning
- identify different elements, principles, and approaches to learning
- recognize the role of modelling and students' self-efficacy in enhancing learning.

3 UNIT 3:	**Learning theories and their application**
Week	Content
7	Introduction to learning Learning theories (Piaget, Skinner, and Gestalt)
8	Learning theories (Vygotsky and Bandura) Principles of learning
9	Different approaches to learning (social and humanistic)

Teaching methodologies

- Interactive lectures
- Brainstorming
- Cooperative learning techniques
- Group discussions
- Handouts

Unit 4: Attributes of a learner: Intelligence, motivation, and metacognition

Unit 4 investigates how to incorporate Gardner's theory of multiple intelligences into classroom teaching. This unit will also help Student Teachers compare and contrast the ways in which students from various cultural and ethnic groups are apt to be alike and different from one another. They will identify the implications of these differences for classroom practices. Additionally, Student Teachers will identify the components of self-regulation, metacognition, and motivation and will investigate their impact on teaching and learning.

Duration: 3 weeks (9 hours)

Learning outcomes

After completing this unit, Student Teachers will be able to:

- understand the concept of intelligence and multiple intelligences
- identify and define types of metacognition
- discuss different techniques of motivation and their usefulness in classroom.

4 UNIT 4:	**Attributes of a learner: Intelligence, motivation, and metacognition**
Week	Content
10	The meaning and concept of intelligence Multiple intelligences theory (Howard Gardner)
11	Metacognition Typology of metacognitive components Facilitating students' metacognition
12	Introduction to motivation Types of motivation Motivational techniques Application of motivation principles in education

Teaching methodologies

- Interactive lectures
- Question and answer
- Group discussions
- Role play

Unit 5: Role of educational psychology in assessment and evaluation

Unit 5 is designed to develop analytical and critical thinking skills among Student Teachers. This unit will facilitate their understanding of different types of assessment procedures in light of educational psychology. Student Teachers will develop skills to identify the need for assessment and to facilitate the learning process through the use of assessment. Additionally, this unit will explore assessment through engagement in authentic tasks pertinent to classroom assessment.

Duration: 3 weeks (9 hours)

Learning outcomes

After completing this unit, Student Teachers will be able to:

- explain various alternative, authentic, and performance-based assessment techniques
- develop different criteria-based tasks and assessment plans to evaluate their students' learning and to improve their own classroom practices
- use rubrics to implement different authentic and performance assessments.

5 UNIT 5:	Role of educational psychology in assessment and evaluation
Week	Content
13	Assessing instructional objectives Classroom assessment (grading procedure, formative and summative evaluation)
14	Tests (norms-referenced and criteria-referenced) Test construction and different types of tests
15	Alternative to traditional assessment (authentic and performance) Introduction to rubrics for assessment and evaluation in education
16	Revision

Teaching methodologies

- Whole-class discussions
- Pair work
- Individual work
- Cooperative learning

Assessments

A variety of assessment techniques will be used, including exams, assignments, and a portfolio. Each of the following assessments will account for the listed percentage of Student Teachers' final marks:

- midterm (covers Units 1 and 2): 30%
- final exam (covers Units 3–5): 50%
- internal assessments: 20%
  - assignments: 10%
  - portfolio: 10%

Grading policy

University grading policy, the details of which will be provided in class, will be followed.

Textbooks and references

The course will draw on textbooks, journal articles, and websites. A list of these will be distributed in class.

Resources

The following resources may be helpful to you in choosing appropriate readings. You may include your chosen list of readings on the syllabus or distribute it in class. However, readings should include only those resources that you expect students to use throughout the course. Other readings should be distributed as needed. Identify specific chapters from recommended books.

Eggen, P & Kauchak, D. (2004) *Educational Psychology: Windows on Classroom.* (4th ed.) Upper Saddle River, NJ: Prentice Hall.

Framingham, J. (2011). *Types of Psychological Testing.* Psych Central. Available from
- http://psychcentral.com/lib/2011/types-of-psychological-testing/

Kerri-Lee, K. (2003). *Educational Psychology for Learning and Teaching.* Melbourne: Nelson Thomson.

Additional reading

Bhatia, K. (2004). *Psychological Foundation of Education*. New Delhi: Kalyani.

Black, P. & Wiliam D. (2009), Developing the Theory of Formative Assessment. *Educ Asse Eval Acc 21*: *5–31*. doi: 10.1007/s11092-008-9068-5.

Stiggins, R. J. & Popham, W. J. (2008). *Assessing Students' Affect Related to Assessment For Learning: An Introduction for Teachers.* Retrieved from
- http://datause.cse.ucla.edu/library_results.php?q=oph&c=&id=618#618

Teaching notes for representative syllabus 1

Student Teachers complete a course in child development in the first year of their programme. Depending on their need for review, you may not need to go in depth on theories of child development or topics such as special needs. Gardner's theory, included in this syllabus, has been challenged by research. In teaching about the theory of multiple intelligences, be sure to help Student Teachers critique it and recognize its limits.

NOTE: The session plans should be read in conjunction with the representative syllabus.

Unit 1: Introduction to educational psychology

Essential knowledge questions

- What is the basic concept of educational psychology?
- What are different principles of educational psychology?
- How can theoretical perspectives be used in the field of educational psychology?

Possible practical activities

Conduct the following activities to provide hands-on experience to Student Teachers in relation to the course:

- Share relevant websites and other sources for reading.
- Prepare a list of educational implications resulting from the use of educational psychology in school education.
- Collect views of schoolchildren of varying ages in relation to their own physiological development.

Week 1: Introduction to the course

Sample session

The session will start with the course introduction. Once the course has been outlined, share learning expectations with the class as well as information about course assessment and grading policy. Later in the session, the meaning of educational psychology and its concepts will be discussed by examining a case study and reflecting on Student Teachers' own experiences in the authentic classroom context.

Introduction

The first two weeks will focus on how educational psychology can increase student achievement.

Brainstorming

Write the meaning and principles of educational psychology on the board. Let Student Teachers explain their understanding of the meaning and concept of educational psychology. Write down all the responses derived from the discussion.

Writing definitions in small groups

Divide Student Teachers into four groups. Ask each group to write a definition of educational psychology in their own words based on ideas elicited during the brainstorming session and their own experiences.

Instructor's input

Review the definitions from at least four groups and link them with different definitions of educational psychology from the literature. Help Student Teachers rephrase their definitions if necessary.

During this portion of the class, be sure to emphasize educational psychology concepts and the principles of educational psychology derived from different schools of psychology.

Week 2: Scope and application of educational psychology in the classroom

Sample session

Initiate a discussion on the meaning and concepts of educational psychology. (This can act as a review of the material covered in week 1.) Later, use the think, pair, share technique to encourage Student Teachers to discuss the assigned reading on the scope of educational psychology. They should share their understanding with the whole class.

Towards the end, elaborate on the scope of educational psychology by presenting it from various perspectives.

Assigned reading

This is a reading on the nature and scope of educational psychology.

- http://johnparankimalil.wordpress.com/2012/03/09/meaning-nature-and-scope-of-educational-psychology/

Week 3: Branches of educational psychology and the relationship between educational psychology and other disciplines

Sample session

Think, pair, share (Option 1)

For this class, prepare a short handout to distribute for this activity. Use the information provided on http://www.innovateus.net/innopedia/what-educational-psychology-0 to create the handout.

Student Teachers will gather in small groups or pairs to discuss the relationship between educational psychology and other disciplines. They will then present their work to the whole class.

Distribute the handouts, continue the discussion in small groups or pairs on the relationship between educational psychology and other disciplines, and share a graphical representation of such relationships.

Role play (Option 2)

Role play is a classroom simulation technique. A well-constructed role-play activity can help highlight real-world issues through which students can become deeply involved in a topic.

Details of using a role play as a teaching strategy can be downloaded from:

➢ http://serc.carleton.edu/introgeo/roleplaying/index.html

Unit 2: Learner development

Essential knowledge questions

- What is the effect of home, family, school, and teachers on students' social development?
- Why are creativity and critical thinking essential for the development of students' cognition?
- What are different ways that students develop moral and ethical values?

Possible practical activities

Some practical activities to teach the content of this unit might include:

- read-reflect-share and discuss
- tour guide for an alien
- fact or fiction.

Details on these and other critical thinking activities can be found on the following sites:

- http://homeworktips.about.com/od/paperassignments/a/Critical-Thinking-Exercises.htm
- http://www.collegesuccess1.com/ThinkingM.htm

Week 4: Home, family, school, and teacher as factors in social development

Suggested strategies

- Whole-class discussion
- Pair work
- Cooperative learning
- Individual work

Sample session

Introduction

Conduct a short discussion session to introduce the topic.

Instructor's input

Use the interactive lecture technique to introduce the effects of early social development on students. Encourage Student Teachers to share their childhood memories. Reinforce the principles of human development with the help of Student Teachers' experiences.

Group activity

Divide Student Teachers in four groups, and assign a topic from the lesson to each group to discuss.

Ask each group to create a presentation on the impact of home, family, school, or teacher, using concept sketches (sketches or diagrams that are concisely annotated with short statements that describe the processes, concepts, and interrelationships). Ask each group to share their work with the whole class.

Week 5: Critical thinking, creativity, assessing creativity, and creativity in the classroom

Sample session

While working in small groups, Student Teachers will critically analyse a case. The Instructor can either develop cases or look for real-life cases about issues that will encourage critical thinking by Student Teachers. In Pakistan, the media often report on a wide range of issues such as corporal punishment, the energy crisis, and human rights. Student Teachers should investigate specific cases related to these or other issues, and suggest ways to improve the situation. They should consider what the case is about, who is involved, the issues, different perspectives, and why the case is important.

Alternatively, the jigsaw strategy can be used as a method for Student Teachers to work on different case studies. Divide the class into small groups, with each group working on a case study. Once the groups have analysed the cases, they will be reshuffled to form new mixed-ability groups. In these new groups, members share their learning from the previous group. Please consult the following link for further details about the jigsaw strategy:

- http://serc.carleton.edu/NAGTWorkshops/coursedesign/tutorial/jigsaw.html

Based on Student Teachers' insights, which can be narrowed down through questions, conduct a whole-class discussion on critical thinking.

To encourage reflective thinking, Student Teachers will maintain reflective journals and record what they learn from the sessions and from readings.

Week 6: Lawrence Kohlberg's theory of moral development

Suggested strategies

- Pair work
- Individual work
- Cooperative learning (jigsaw reading)

Sample session

Divide students into small groups. Distribute copies of 'The Heinz Dilemma' (available from http://www.vtaide.com/blessing/Kohlberg.htm). Give Student Teachers 15 minutes to read scenarios 1–3 and discuss their opinions in their groups.

Set some ground rules relating to listening to each other and practising social skills during and after the discussion.

Bring the groups together as a whole class so that groups can share their opinions and defend their reasoning by giving examples. Other groups will be encouraged to critically analyse opinions shared by the presenters, ask questions, and suggest alternatives based on reasoning. (It is important to note that at this stage, the process is more important than whether responses are correct or incorrect.)

After the presentations, introduce stages of Kohlberg's theory of moral development through a presentation (using PowerPoint or overhead transparencies) or through handouts. The levels of moral development according to Kohlberg include:

- Level 1, pre-conventional morality
  - Stage 1: Punishment–Obedience Orientation
  - Stage 2: Instrumental Relativist Orientation
- Level 2, conventional morality
  - Stage 3: Good Boy–Nice Girl Orientation
  - Stage 4: Law and Order Orientation
- Level 3, post-conventional morality
  - Stage 5: Social Contract Orientation
  - Stage 6: Universal Ethical Principle Orientation.

Details of the levels of Kohlberg's moral development stages can be found on the following websites:

- 'Kohlberg's Theory of Moral Development: Stages of Moral Development'
  - http://psychology.about.com/od/developmentalpsychology/a/kohlberg.htm
- 'Kohlberg's Stages of Moral Development'
  - http://www.usefulcharts.com/psychology/kohlberg-stages-of-moral-development.html

Unit 3: Learning theories and their application

Essential knowledge questions

- What are different elements and principles of learning?
- Given the different theories, how do perspectives on learning concepts vary?
- How does the knowledge of learning help teachers facilitate the learning process and enhance self-efficacy among students?

Week 7: Introduction to learning and learning theories (Piaget, Skinner, and Gestalt)

Sample sessions

Sample session (Option 1)

Divide the class into groups of four or five, depending on the total number of class participants. Introduce the topic by positing a series of self-reflection questions such as the following:

- Think of your school experience. What is a process that helped you master a skill (e.g. cooking, singing, writing, or even completing an assignment)?
- Who facilitated this experience? How did that person do it? Was it an exciting experience? Why or why not?
- What evidence supports your argument?

Give Student Teachers 10 minutes to write a response to these questions and then share and discuss their responses with their groups.

Next, ask the groups to write main points from their discussions and then present them to the whole class. (If chart paper is available, they can create a chart for their presentations.) Highlight the indicators or components of learning from the main points presented and encourage participants to create their own definition of learning.

Each group will develop one definition, write it on a chart paper, and display it for a gallery walk. During the gallery walk, encourage Student Teachers to respond to the charts by writing comments and suggestions to make the definitions comprehensive and reader friendly.

Sample session (Option 2)

Give the members of each group handouts, URLs, and/or books about the three learning theories. Ideally, these resources should be provided prior to the class. On the session day, divide the class into small groups. The Student Teachers will use these materials to prepare a presentation.

During the presentation, Student Teachers will take notes or write questions to ask once the presentation is over. Presenters can use any framework or mode of presentation, such as PowerPoint, overhead transparencies, charts, videos, and handouts.

When the presentation task is assigned, share assessment rubrics with the groups.

Week 8: Learning theories (Vygotsky and Bandura) and principles of learning

Sample session

In continuation of the previous week's work, Student Teachers will present the theories of learning. On the last day, the focus of the session will be the principles of learning.

Week 9: Different approaches to learning (social and humanistic)

Sample session 1

Share a case study developed or modified from the following source: http://www.usask.ca/education/coursework/802papers/Skaalid/casestudy.html. Alternatively, share the link with Student Teachers if it is feasible.

Give Student Teachers 15 minutes to review the case study, and then ask them to write the main points on flash cards. Conduct a whole-class discussion.

After the display of all the flash cards, highlight main components or elements of the constructivist approach and generate an interactive discussion.

Sample session 2

Divide Student Teachers into groups of four and share the following scenario with them:

> You are at an interview for a job at a school with a large number of students from lower socio-economic backgrounds. The principal asks, 'At our school, some of our students live in troubled environments or family environments that are not very socially sound, and some are refugees or from new immigrant families with financial difficulties. Considering the problems these students experience in their lives, how will you engage them in their studies?'

Task

Give Student Teachers 30 minutes to discuss and deliberate on the above scenario in their small groups.

Next, engage the Student Teachers in a debate. (The Instructor plays the role of the moderator.) Share the guidelines and ground rules for effectively administering the debate. Use the information on pedagogy related to case studies (http://serc.carleton.edu/introgeo/icbl/index.html) and engaging in debates (http://serc.carleton.edu/files/NAGTWorkshops/coursedesign/tutorial/debates.doc) to guide the session.

Assessment

Select a few principles identified or highlighted during the discussion of different learning theories.

Give one principle to each group so that they can design an activity for secondary school students that applies the highlighted principle.

Allocate 30 minutes for preparation and discussion and then 8 minutes for each group to present to the whole class.

Share the rubrics and criteria for assessment with the Student Teachers before the presentation. Suggest that Student Teachers consider self-assessment and peer assessment in the design of their activity.

NOTE: The information for units 1–3 offers a complete sample of planning notes that can be used as a reference point. For Units 4 and 5, only essential knowledge questions and suggested resources are provided.

Unit 4: Attributes of a learner: Intelligence, motivation, and metacognition

Essential knowledge questions

- What is intelligence?
- How are metacognition and the theory of multiple intelligences similar or different?
- How can teachers use different techniques of motivation in the classroom to promote learning?

Student readings

Weiner, B. (2000). Interpersonal and Intrapersonal Theories of Motivation from an Attribution Perspective. *Educational Psychology Review, 12*, 1–14.

Metacognition

Papaleontiou-Louca, E. (2008). *Metacognition and Theory of Mind*. Newcastle, UK: Cambridge Scholars Publishing. Available from:

➢ www.c-s-p.org/flyers/9781847185785-sample.pdf

Schraw, G. & Moshman, D. (1995). Metacognitive Theories. E*ducational Psychology Review, 7*, 351–371. Available from:

➢ http://digitalcommons.unl.edu/edpsychpapers/40

Motivation

Eggen, P & Kauchak, D. (2004). *Educational Psychology: Windows on Classroom*. (4th ed.) Upper Saddle River, NJ: Prentice Hall.

Woolfolk, A. E. (2010). *Educational Psychology* (11th ed.). Boston: Allyn & Bacon.

Web resources

'Howard Gardner's Multiple Intelligences: A Theory for Everyone'

➢ http://www.educationworld.com/a_curr/curr054.shtml/

'Evolutionary Psychology and Intelligence Research' by S. Kanazawa

➢ http://personal.lse.ac.uk/Kanazawa/pdfs/AP2010.pdf

'A Theory of Intelligence as Processing: Implications for Society' by J. F. Fagan III

➢ http://www.psy.cmu.edu/~rakison/fagan.pdf

'McClelland's Human Motivation Theory: Discovering What Drives Members of Your Team'

➢ http://www.mindtools.com/pages/article/human-motivation-theory.htm

'Theories of Motivation'

➢ http://psychology.about.com/od/psychologytopics/tp/theories-of-motivation.htm

Unit 5: Role of educational psychology in assessment and evaluation

Essential knowledge questions

- What are the different types of assessment procedures?
- What are alternative, authentic, and performance assessments?
- How are rubrics used in authentic and performance assessments?

Student readings

Black, P. (1998). Formative Assessment: Raising Standard. *School Science Review, 80*, 39–46. Available from

➢ http://blog.discoveryeducation.com/assessment/files/2009/02/blackbox_article.pdf

Black, P. & Wiliam, D. (2009). Developing the Theory of Formative Assessment. *Educ Asse Eval Acc*, 21. 5–31. doi: 10.1007/s11092-008-9068-5.

Black, P. & Wiliam, D. (1998). Assessment and Classroom Learning. *Assessment in Education*, *5*, 7–74.

Framingham, J. (2011). *Types of Psychological Testing, Psych Central*.

➢ http://psychcentral.com/lib/2011/types-of-psychological-testing

accessed 10 July 2012.

Stiggins, R. J. (2007). Assessment Crisis: The Absence of Assessment for Learning, *Phi Delta Kappan*, *83*, 758–765. Available from

➢ http://www.edtechpolicy.org/CourseInfo/edhd485/AssessmentCrisis.pdf

Stiggins, R. J. & Popham, W. J. (2008). *Assessing Students' Affect Related to Assessment For Learning: An Introduction for Teachers*. Retrieved from

➢ http://datause.cse.ucla.edu/library_results.php?q=oph&c=&id=618#618

REPRESENTATIVE SYLLABUS 2

Prepared by
Sadaf Naz

Year, semester
Year 3, semester 5

Credit value
3 credits (48 contact hours)

Prerequisite
Successful completion of semesters 1–4

Course description

The major objective of the Educational Psychology course is to provide Student Teachers with information on the core principles of teaching and learning, how to use these principles to understand the behaviour of students, and to consistently apply these principles to classroom practice. The purpose of this course is also to develop learners' insight. This course will help Student Teachers understand different psychological concepts by examining their own learning and applying these concepts as teachers. The course concentrates on core concepts and principles as well as the central ideas of educational psychology. Topics include the nature and function of educational psychology, learning theories, memory and forgetting, intelligence, behaviourist and social cognitive views of learning, intrinsic and extrinsic motivation, measurement, and evaluation.

Course objectives

By the end of the course, Student Teachers should be able to:

- describe in detail the multidisciplinary nature and function of educational psychology
- define learning and develop critical thinking about the behaviourist and cognitive views of learning
- help students understand the relationship between educational psychology and other disciplines
- define information processing
- define motivation and explain its role in learning
- compare and contrast intrinsic and extrinsic motivation
- incorporate the different theories of intelligence in their teaching
- define individual differences.

Course content

The course content will be covered within one semester (year 3, semester 5) and contains four units. Relevant topics will be covered in each unit.

Unit 1: Introduction to Educational Psychology

- Introduction to the Educational Psychology course
- The nature of Educational Psychology
- The scope of Educational Psychology
- The importance of Educational Psychology for teachers
- The relationship between Educational Psychology and other disciplines

Unit 2: Learning and information processing

- Introduction to learning
- Elements of learning
- Principle of learning
- Learning theories
- Behaviourist views of learning
    - Classical conditioning
    - Operant conditioning
- Cognitive views of learning
    - Social cognitive theory
- Approaches to learning
    - Social approach
    - Humanistic approach
    - Information processing
- The process of information

Unit 3: Motivation

- Introduction to motivation
- Definition of motivation
- The role of motivation in learning
- Types of motivation
    - Intrinsic motivation
    - Extrinsic motivation
- The role of intrinsic and extrinsic motivation in the classroom
- Comparing intrinsic and extrinsic motivation
- Motivational techniques for the classroom
- Maslow's theory of motivation
- The implications of Maslow's theory of motivation in classroom

Unit 4: Intelligence

- Concept of intelligence
- Definition of intelligence
- Theories of intelligence: An overview
- Multiple intelligences theory
- The implications of multiple intelligences theory
- Definition of individual differences
- The importance of individual differences
- Overview of physical, emotional, social, and mental differences
    - Physical disabilities
    - Mental retardation
    - Emotional disturbances
    - Socially disadvantaged
    - Gifted learners

Teaching methodology

Teaching methods for this course will include interactive lectures, question and answer, group discussion, and brainstorming.

Textbooks and references

The course will draw on textbooks, journal articles, and websites. A list of these will be distributed in class.

Assessments

A variety of assessment techniques will be used, including exams, assignments, and a portfolio. Each of the following assessments will account for the listed percentage of Student Teachers' final marks:

- midterm exam: 15%
- final exam: 55%
- internal evaluations: 30%
    - assignments: 10%
    - presentation: 10%
    - attendance, portfolio, and tests: 10%.

Grading policy

University grading policy, the details of which will be provided in class, will be followed.

Resources

The following resources may be helpful for choosing appropriate readings. You may include your chosen list of readings on the syllabus or distribute it in class. However, readings should include only those resources that you expect students to use throughout the course. Other readings should be distributed as they are needed. Identify specific chapters from recommended books and relevant websites. Some materials that may be helpful are listed below.

Ormrod, J. (2010). *Educational Psychology: Developing Learners*. Columbus, OH: Pearson.

Santrock, J. W. (2001). *Educational Psychology.* Blacklick, OH: McGraw-Hill.

Eggen, P & Kauchak, D. (2004). *Educational Psychology: Windows on Classroom*. (4th ed.) Upper Saddle River, NJ: Prentice Hall.

Web resources

This website has many special features to help locate articles, images, presentations and other resources in the area of educational psychology.

- www.googlescholar.com

The Motivation Tool Chest contains information and self-education resources that are free to download.

- www.motivation-tools.com

Teaching notes for representative syllabus 2

Unit 1: Introduction to educational psychology

Week 1: Introduction to the course

Sample session (Option 1)

Brainstorming (10 minutes)

Write major terms related to the course on the board and ask Student Teachers to discuss their understanding of these terms. Write down all the meanings they identify.

Instructor's input (20 minutes)

Review the major concepts of educational psychology, along with relevant points highlighted by Student Teachers, and include classroom examples. Present salient features of all topics covered in the Child Development course, including the nature and development of individual personality, learning theories, teaching methods, motivation, and social and moral development. Relate this to the definition, scope, and importance of educational psychology.

Whole-group discussion (20 minutes)

Divide the class into small groups of three to five Student Teachers. Ask the Student Teachers to summarize and write the salient features. Note ideas that are repeated or have consensus.

Syllabus review (10 minutes)

Hand out copies of the syllabus to the class. Ask the Student Teachers to review it and critically analyse various sections. Point out that they will discover new and different approaches to teaching and learning that may feel uncomfortable at first but will soon become familiar and enjoyable.

Sample session (Option 2)

Give a brief introduction to educational psychology. Information on the following topics can be found on the listed websites, some of which offer PowerPoint presentations:

- education: http://freedownload.is/ppt/what-is-psychology-2723662.html
- psychology: http://freedownload.is/ppt/chapter-1-introduction-to-psychology-8499815.html
- educational psychology
  - http://www.squidoo.com/educationalimportance
  - http://freedownload.is/ppt/educational-psychology-definitions-221571.html

Group activity

Divide the class into three groups and assign each a topic from Unit 1 of the educational psychology syllabus. Give the groups 25 minutes to share their understanding of the topic with each other and prepare a report on their points of agreement. After, each group will present their work to the entire class.

Take the final five minutes of class to conclude the discussion and relate the points made by each group to the topic as a whole.

Sample session: Definition of educational psychology

Class brainstorming (10 minutes)

Write educational psychology on the board and ask Student Teachers for their definition of the term.

Write down all the meanings that have been identified on the board.

Group brainstorming (10 minutes)

Divide the class into three groups and ask them to review the meanings generated in the class brainstorming session. From the information on the board, each group should prepare a comprehensive definition of learning, motivation, and intelligence.

Instructor's input (30 minutes)

Review major definitions of learning, motivation, and intelligence, and include input from the Student Teachers' group brainstorming. Also, provide information on the history and definition of educational psychology, including reference to relevant theorists.

Discussion (10 minutes)

Ask Student Teachers to discuss the major definitions of educational psychology with each other.

Week 2: Nature of educational psychology

Sample session: Nature of educational psychology

Group discussion and presentation (40 minutes)

Divide the class into small groups. Give each Student Teacher a handout on the nature of educational psychology. The Student Teachers should take 20 minutes to read the handout individually and then discuss it in their small groups. During the discussion, they should organize their main points.

Following the discussion, each group will present its main points and summarize their discussion.

Note that it will be necessary to prepare a handout before this class session. Consider using the information on the following websites to prepare materials for this session:

- 'Scope of Educational Psychology'
  - http://www.pcer.ac.in/B.Ed.%20notes/Paper%202%20Section%201/UNIT%20I.pdf
- 'Meaning, Nature and Scope of Educational Psychology' by John Parankimalil
  - http://johnparankimalil.wordpress.com/2012/03/09meaning-nature-and-scope-of-educational-psychology/

Instructor's input (20 minutes)

Sum up the Student Teachers' discussions and further elaborate on the nature of educational psychology with suitable examples.

Sample session: Scope of educational psychology

Class brainstorming (10 minutes)

Conduct a brainstorming activity by asking the following questions:

- What is meant by the word scope?
- To what does the scope of educational psychology refer?

Small-group activity (20 minutes)

Divide the class in small groups. Ask Student Teachers to prepare a concept map on the scope of educational psychology on chart paper.

Instructor's input (20 minutes)

Give input on the scope of educational psychology. Ask the Student Teachers questions and have them contribute to the lecture.

Small-group activity (10 minutes)

Have the Student Teachers return to their small groups and ask them to revisit their concept map to determine whether it should be modified. They may add or delete items.

Week 3: The importance of educational psychology for teachers

Sample session

Brainstorming (10 minutes)

Ask the following questions about the importance of educational psychology for teachers:

- To what extent is the knowledge of educational psychology necessary for teachers?
- How can a teacher apply the knowledge of educational psychology in the teaching-learning process?

Pair-share activity (10 minutes)

Ask Student Teachers to share their understanding of the importance of educational psychology with the person sitting next to them. When a few minutes remains, bring the class back together for a brief discussion on the main points.

Small-group activity (20 minutes)

Divide the class into small groups and ask the Student Teachers to discuss the importance of educational psychology. They should prepare a list during the discussion, which they will be asked to share with the whole class.

Instructor's input (20 minutes)

Provide input on the importance of educational psychology and ask the groups to share the points they discussed in the small-group activity. Point out that the knowledge of psychology is very important for teachers, as this knowledge can help them address social, emotional, and physical problems faced by students.

Educational psychology also has a great role in teachers helping students through guidance and counselling. The following points might be discussed to highlight the importance of educational psychology for teachers:

- Educational psychology enables teachers to understand the mental status of their students.
- Educational psychology helps teachers evaluate their students' performance.
- Educational psychology helps teachers change their attitudes towards students.
- Educational psychology produces new theories of learning for better education.
- Educational psychology helps teachers modify student behaviour, so that they behave positively in different situations.

Sample session: The relationship between educational psychology and other disciplines

Group discussion (30 minutes)

Divide the class into small groups. Give Student Teachers a handout on the relationship between educational psychology and other disciplines. Give Student Teachers 20 minutes to read the handout on their own and then discuss it their groups and reflect on text. As they discuss the text, they should prepare a list of main points for presentation.

Following the discussion, each group will present its main points and summarize their discussion.

Instructor's input (30 minutes)

Sum up the presentation and elaborate on the relationship between educational psychology and other disciplines. Main points may include any of the following:

- educational psychology and school organization
- educational psychology and children with special needs
- educational psychology and mental health
- educational psychology and learning
- educational psychology and social adjustment
- educational psychology and personality development
- educational psychology and different stages of growth
- educational psychology and guidance and counselling
- educational psychology and teaching methods
- educational psychology and evaluation
- educational psychology and curriculum
- educational psychology and teachers.

2 UNIT 2:		Learning and information processing
Week #	Session #	Topics/themes
4	Session 10	Introduction to learning
	Session 11	Elements of learning
	Session 12	Principles of learning
5	Session 13	Learning theories
	Session 14	Behaviourist views of learning
	Session 15	Behaviourist views of learning: Classical conditioning
6	Session 16	Behaviourist views of learning: Operant conditioning
	Session 17	Cognitive views of learning
	Session 18	Cognitive views of learning: Social cognitive theory
7	Session 19	Approaches to learning
	Session 20	Approaches to learning: Social approach
	Session 21	Approaches to learning: Humanistic approach
8	Session 22	Approaches to learning: Information processing
	Session 23	The process of information
	Session 24	Principles of information processing: Advanced organizers, recall previous work, and post-discussion synthesis

Week 8: Approaches to learning: Information processing

Sample session

Give a brief introduction of the topic 'What is learning?' and discuss different approaches to learning.

Show a video on cognitive process. (An appropriate video can likely be found on YouTube.)

Alternatively, provide individual reading handouts on information processing. One possible reading may be Huitt's 'The Information Processing Approach to Cognition', available from http://www.edpsycinteractive.org/topics/cognition/infoproc.html. Ask Student Teachers to read the handouts and then conduct a whole-class discussion.

After watching the video or reading the text, conduct a class dialogue on different approaches to learning.

Conclude the session and add examples to explain different concepts of information processing.

3 UNIT 3:		Motivation
Week #	Session #	Topics/themes
9	Session 25	Introduction to motivation
	Session 26	Definition of motivation
	Session 27	The role of motivation in learning
10	Session 28	Types of motivation
	Session 29	Types of motivation: Intrinsic motivation
	Session 30	Types of motivation: Extrinsic motivation
11	Session 31	The role of intrinsic and extrinsic motivation in the classroom
	Session 32	Comparing intrinsic and extrinsic motivation
	Session 33	Motivational techniques for the classroom
12	Session 34	Motivational techniques for the classroom
	Session 35	Maslow's theory of motivation
	Session 36	The implications of Maslow's theory of motivation in the classroom

Week 10: Types of motivation: intrinsic and extrinsic motivation

Sample session

Small-group discussion and gallery walk (10 minutes)

Ask Student Teachers to work in small groups to prepare a profile of a famous personality. They should discuss this individual's key successes or failures as well as the motivations for those successes or the reasons for failures. Each group will display their profile and prepare a summary of the group discussion for the whole class.

Student presentations (30 minutes)

Divide Student Teachers into four small groups; two groups will read a handout on internal motivation and two will read a handout on external motivation.

Ask each group to prepare a five-minute presentation on the assigned topic and present it to the whole class. (You will need to be clear about whether the presentation is to be given in this session or later. If it is to be presented in this session, you will have to determine what activities to eliminate in order to make time.)

Small-group activity: Reflection (20 minutes)

In light of the famous personality discussed during the first part of the class, ask Student Teachers to reflect on the motivation and address the following questions:

- What could a teacher do to enhance students' internal motivation towards learning and behavioural changes?
- How can students who lack motivation use their abilities towards learning?

Homework

Ask Student Teachers to write a brief essay on the impact of external motivational factors on learners.

Week 11: Motivational techniques for the classroom

Sample session

Introduction to the topic (5 minutes)

Introduce the topic by reviewing the previous work done on intrinsic and extrinsic motivation.

Self-reflection (5 minutes)

Student Teachers will reflect on their own experiences and write a response to one or more of the following questions:

- How can you motivate students to do work or change their willingness to work?
- Does motivation play a role in achieving a goal?
- How can a teacher motivate the learners who lack motivation to learn?

Pair work (15 minutes)

Give Student Teachers five minutes to share their responses to the self-reflection questions with a partner. They should consider the importance and functions of motivation in learning and teaching, and develop a link between previous material and the new topic. This can be done through brainstorming.

Presentation: Effective motivational strategies and techniques (30 minutes)

Present effective motivational strategies and techniques to Student Teachers. To make the session interactive, pause after each strategy to ask Student Teachers to highlight the implications of a motivational strategy in a classroom situation.

If you prepare a PowerPoint presentation or use overhead transparencies, consider including the following strategies and techniques in your presentation:

Motivational strategies and techniques

• Extrinsic reward and punishment • Praise and blame • Novelty • Arousing interest • Curiosity • Mode of presentation • Goals • High and realistic expectations	• Securing attention and creating enthusiasm • Attitude in motivation • Success versus failure • Positive versus negative • Self-motivation and will to learn • Quality of environment • Drive for self-actualization • Clear feedback	• Active involvement • Capitalize on student interest • Avoid creating intense competition among students • Be enthusiastic about the subject • Application of various teaching methods • Respect for personality

Group brainstorming and discussion (10 minutes)

Ask Student Teachers to work in small groups to discuss the importance of using strategies and techniques of motivation while teaching. After the discussion, each group will be asked to share their main points with the whole class.

NOTES ON MOTIVATION: Learning and motivation are interrelated – in fact, motivation is a vital element to the learning process. It is important in the process of change and construction of knowledge because it influences a student's willingness to make intangible changes. Researchers and theorists define two main types of motivation: extrinsic and intrinsic. Thus, students may be internally or externally motivated to learn.

Different theorists classify human motives into different categories. For instance, infants' early behaviour is largely determined by basic biological needs – a child cries when hungry, cold, or in pain. But as a child grows, new motives appear that are learned by interacting with others; these are psychological motives. Maslow's theory of motivation looks at the relationship among motives and the opportunities afforded by the environment.

4 UNIT 4:		Individual differences and intelligence
Week #	Session #	Topics/themes
13	Session 37	Concept of intelligence
	Session 38	Definition of intelligence
	Session 39	Theories of intelligence: An overview
14	Session 40	Theories of intelligence: An overview
	Session 41	Multiple intelligences theory
	Session 42	The implications of multiple intelligences theory
15	Session 43	Definition of individual differences and its significance for teachers
	Session 44	The importance of individual differences
	Session 45	Overview of physical, emotional, social, and mental differences
16	Session 46	Physical disabilities Learning disabilities
	Session 47	Emotional disturbances Socially disadvantaged
	Session 48	Gifted learners

Week 13: Intelligence: Definition of intelligence

Sample session

Introduction to the new topic (5 minutes)

Briefly introduce the new topic.

Self-reflection (10 minutes)

Intelligence is an important trait of the human personality and one that makes us unique. Ask Student Teachers to reflect on their own experiences and concepts about intelligence.

Instructor's input (30 minutes)

Discuss the concept of intelligence and differences in intelligence among students.

Think, pair, share (15 minutes)

Ask Student Teachers to work in pairs and discuss intelligence traits. Then, ask several pairs to share one trait with the whole class and explain how it reflects intelligence.

Use the final five minutes of class to summarize the discussion and further elaborate different points if needed.

Week 15: Definition of individual differences and its significance for teachers

Sample session

Introduction to the new topic (5 minutes)

Provide a brief introduction to the topics and highlight the following points:

- the meaning, nature, and definition of individual differences
- how knowledge about individual differences is essential for teachers
- the roles teachers can play to effectively cater to individual differences among students.

Instructor's input (35 minutes)

Discuss the following points with Student Teachers:

- the meaning and nature of individual differences
- areas of individual differences, including physical, psychological, and cognitive abilities
- causes of individual differences, such as genetic and environmental causes.

Group discussion (15 minutes)

Divide Student Teachers into small groups. Ask each Student Teacher to prepare a list of their own traits and determine whether those attributes have been influenced by genetic or environmental factors. After five minutes, they will share this list with their group.

Conclusion (5 minutes)

Briefly summarize all the points discussed.

NOTES ON INTELLIGENCE: Every field of life, whether it is education, social and physical science, literature, or art is influenced by intelligence. Intelligence enables an individual to adjust and adapt to a new environment. This unit will explore the concept of intelligence and different theories of intelligence. Student Teachers will learn to:

- incorporate Gardner's theory of multiple intelligences into their teaching
- compare and contrast the ways in which students from various cultural and ethnic groups are apt to be alike and different from one another
- identify the implications of these differences for classroom practice.

Sternberg believes that intelligence is comprised of three separate but interrelated abilities: analytical, creative, and practical. Details on this theory are available from

➢ http://www.edpsycinteractive.org/topics/cogsys/intell.html.

Further information on individual differences is available from

➢ http://personality-project.org/revelle/publications/ids.html.

4

Integrated teaching notes

During the curriculum development process, contributing faculty were encouraged to keep notes that would be useful to others who may teach this course in the future. These were submitted along with the course syllabi. Teaching notes include ways to introduce the course, ideas for teaching units and sessions, sample lessons plans, and suggestions for reading and resource material. These have been integrated into a single section of this document to create a rich and varied collection of ideas that is easily accessible to others. The section is organized by theme. Except in cases where there is duplication of ideas, faculty are credited with their contribution.

Sample session 1: Understanding educational psychology: The history and development of educational psychology

Unit learning outcomes

Knowledge	Skills	Behaviours
History and development of educational psychology	Drawing a timeline Defining terms Developing a glossary of terms	Describe, explain, and draw the timeline through group presentations

At the end of the session, Student Teachers will be able to:

- describe the historical development of educational psychology by drawing a timeline
- develop a glossary of terms identified as important for understanding historical development
- explain how these terms apply to current understanding and usage.

Materials required

- Flip charts
- Copies of handouts on the development of educational psychology (see suggested resources below)
- Bulletin board or wall (somewhere to post Student Teachers' work)
- Thumbtacks
- Markers (different colours)
- Whiteboard or blackboard

Strategies

- Think, pair, share
- Small-group discussions
- Small-group presentations

Introduction

Divide Student Teachers in small groups and give everyone a copy of the handout on the development of educational psychology. The information on the following websites can be used to prepare relevant handouts:

- Educational Psychology Interactive: Audio-Video Materials Related to Educational Psychology http://www.edpsycinteractive.org/materials/videos.html
- Discovering Psychology http://www.learner.org/series/discoveringpsychology/index.html
- History of Psychology http://www.learner.org/series/discoveringpsychology/history/history_flash.html

Development

Give Student Teachers four small flash cards or strips that can be kept for future use. Working in the same small groups, each Student Teacher should select four terms from their handout and write its meaning on the flash card or strip of paper.

Student Teachers should post their cards to create a visual glossary. They should also type up the definitions of the terms they selected and then work with peers to compile a glossary of terms to which they can refer.

Next, Student Teachers will read, discuss, and analyse the handout on the development of educational psychology (through a jigsaw reading activity if the handout is long). Working in the same small groups, each Student Teacher should create a timeline on a flip chart of one era of development based on the handout. After 15–20 minutes, the groups should attach their charts together on a soft board or a wall so that the entire class can see the development of educational psychology from the 19th century to the present. In this way all the group members (whole class) will come to know the history of educational psychology.

Have each group present their timeline, and then engage in an interactive discussion and provide feedback to reinforce the ideas presented.

Discussion questions

- In retrospect, what is the role of the history of educational psychology in shaping our understanding about human behaviour?
- Why do we study educational psychology?
- Why is it important for Student Teachers to study educational psychology?
- How do the theories and knowledge of educational psychology apply in daily classroom practices?

Assessment/assignment

The presentation of the timeline will be assessed using scoring rubrics, which will be developed and shared with the class beforehand. A sample rubric is available from

➢ http://dnowlan.ca/VM/science7/Ecology/Concept%20Rubric.htm.

As part of the informal assessment, a quiz can also be given to Student Teachers to check their understanding.

Sample session 2: Educational psychology schools of thought

Contributed by Tarique Bhatti and Maroof Bin Rauf

Duration

3 hours

Unit learning outcomes

Knowledge	Skills	Behaviours
Schools of psychology	Critical thinking Analytical reasoning	Differentiate and compare different schools; give examples based on experience

At the end of the session, Student Teachers will be able to:

- discuss the given case studies in groups and suggest alternatives to find solutions
- explain different schools of thought of psychology by giving examples from daily life.

Strategies

Materials required

- Flip charts
- Copies of handouts on the development of educational psychology (see suggestions within other sample sessions)
- Markers (different colours)
- Whiteboard or blackboard

- Case study
- Think, pair, share
- Small-group discussions
- Small-group presentations

Introduction

Discuss a case study with the class. The case study can be developed from 'The Case of Marsha Warren', which is available from:

➢ http://www.mhhe.com/socscience/education/elliott/book/case-1.htm.

Introduce the topic after the case study has been discussed.

Also, these resources can be used for guidance on psychological development in historical perspectives:

- Chapter 1, Educational Psychology: Effective Teaching, Effective Learning (3rd ed.)
  - http://www.mhhe.com/socscience/education/elliott/book/case.htm
- Basics of Structuralism and Functionalism
  - http://video.about.com/psychology/Basics-of-Structuralism and-Functionalism.htm

Development

Present the information that will encourage Student Teachers to determine how to address the problems identified in the case. Use a handout or a presentation (e.g. PowerPoint slides or overhead transparencies), so that the information is clearly provided. Give the class 10 minutes to think about the issues on their own and then engage the class in a group discussion. Select a few of the following or use all of them:

- What are some of the facts in the case?
- What are some of the important issues in the case?
- Who is involved with or related to the case?
- What is the problem?
- When did the problem become out of control?
- In your opinion, why did the problem occur?
- What are some assumptions that have been made about this case?
- How would you deal with these assumptions or with speculation?
- How can you tackle this situation?
- What conclusions can you draw about the case?

After the discussion of the case study, connect the case with the different schools of psychology and provide a handout on the different schools. The handout should include the six modern schools – behavioural, cognitive, psychoanalytic, humanism, social, and biological – and two historical views (e.g. structuralism and functionalism).

Give Student Teachers 10 minutes to read the handout to prepare for a class discussion. While leading the discussion, draw and complete tables to organize the information (as in the Instruction section).

Instruction

After reading the handout, invite Student Teachers to revisit the case study and see if their conception of the problem has changed or remained the same. They will identify instances, events, or moments where any of the schools of thought can be applied. The following table can be used to place the instance (or memory) in the appropriate column.

Historical schools of thoughts in psychology	Events identified in the case
Structuralism	
Functionalism	

Modern schools of thoughts in psychology	Events identified in the case
Behavioural	
Cognitive	
Biological	
Humanism	
Social	

Discussion questions

Use the following questions to initiate the discussion:

- If you choose to become a psychologist, which school of thought would you prefer to adopt? Give your reasoning for your response.
- How are the ideas of modern schools of thoughts in psychology similar to or different from the historical views? Give your opinion with reasoning.

Assessment/assignment

Ask Student Teachers to write a two-page essay on one of the two discussion questions above.

Sample session 3: The nature of educational psychology

Introduction (20 minutes)

Introduce the topic of the course: the nature of psychology and educational psychology. Provide an overview of the course and highlight key areas from the syllabus such as course description, unit description, and learning outcomes.

Discuss Student Teachers' expectations regarding course assignments, class readings, tasks, and out-of-class activities.

Previous knowledge (10 minutes)

To gauge Student Teachers' previous knowledge, ask them about the big ideas they discussed in the Child Development course.

Student Teachers will share different answers. For instance, some may refer to development and growth in children, such as social, cognitive, physical, and emotional development, while others may mention learning or individual differences. Based on the answers provided, ask the Student Teachers to highlight the big ideas of the present course. Note the ideas highlighted by the Student Teachers and introduce the units of the course to provide context. Spend time defining educational psychology and its role in education.

Small-group discussion (10 minutes)

Divide Student Teachers in small groups and have them develop a definition of educational psychology. They will then share their definition with the whole class. The Instructor should copy the definitions on the board and then help the class develop a comprehensive definition.

Interactive lecture (10 minutes)

Give an interactive lecture on educational psychology. Ask the following questions:

- Can you name a few psychologists whose work you have read?
- Which doctors treat people who suffer from depression, fatigue, and anxiety?
- Which psychologists performed experiments on these pigeons, dogs, and monkeys?

To make the session interactive, add buzz activities in the session.

Summary (5 minutes)

At the end of the session, summarize the topic.

Homework

Ask Student Teachers to look for some of the principles of educational psychology such as self-efficacy, cooperative learning, and peer tutoring online or in psychology books.

Learning process

Contributed by Liaquat Hussain, Sadia Suleman, and Dr Javed Iqbal

Sample session 1: How do we learn?

Introduction and lecture (30 minutes)

Introduce the unit and discuss the main points regarding the learning process.

Reflection and reading (15 minutes)

Ask Student Teachers to complete a brief written reflection that addresses the following questions:

- What is learning? How do students learn?
- What are some of the learning theories? Provide a summary of some main theories.

After the reflection, provide a handout on learning and ask Student Teachers to read it individually. A class discussion will follow.

Class discussion (15 minutes)

Guide a class discussion in which Student Teachers share their written reflections and information gained from the reading. Review the main points and clarify by answering questions. Add information wherever required.

Sample session 2: Conceptual approaches to psychology

Introduction to the unit

Give a brief introduction to the various conceptual approaches to educational psychology that highlights the following perspectives:

- the biological perspective
- the psychodynamic perspective
- the cognitive perspective
- the behavioural perspective
- the humanistic perspective
- the Gestalt perspective.

Details on different educational psychology perspectives are available from
➢ http://www.psychoid.net/overview-schools-thought.html.

Suggested assignments

Contributed by Liaquat Hussain, Sadia Suleman, and Dr Javed Iqbal

Four types of coursework assignments are suggested. All can be used as is or adapted as needed.

Assignment 1: Response paper

Write a response paper to the following:

> Think of any teacher or class you have taken that has made a particular impression on you. What was it about this experience that has stuck with you? When you reflect on this, begin to tie your thoughts together with the theories covered in this course, such as those of Dewey, Piaget, Vygotsky, Erikson, Skinner, Maslow, and Gardner.

This paper should also address the following questions:

- How did these teachers 'operationalize' the theories we are now studying?
- Did it make a difference in their teaching?
- How did it advance the learning process in their classrooms?

You can also focus your paper on your classroom observations and discuss what you are seeing in action as you visit classrooms. This response paper should critically reflect on issues and ideas presented by the theories you select, especially how a given theory has changed your view of teaching. It should demonstrate how you were able to make meaning out of these theories and how this meaning changed, deepened, or challenged your own thinking on what constitutes 'good' teaching. It should also discuss how you feel these ideas can be operationalized in the everyday practice of teaching.

Assignment 2: Analyse a research-based article on teaching and learning

Select a research-based article from a professional journal on educational psychology and analyse its various components. These components may include:

- overall objective and rationale
- research hypothesis
- methodology (subjects, research design, procedure)
- results
- usefulness to classroom practice
- meaning for educational psychology.

This critique should communicate your understanding of the research presented and its purpose. It should also reflect a meaningful connection between the research and classroom practice. Feel free to comment on the results presented by the authors and how you feel they align with your own experience as a student and as a prospective teacher.

You could, for example, discuss the article with in-service professionals you meet during your observations and include their reactions along with your own response.

Please be sure to attach a copy of the research article to your response paper.

Assignment 3: Learning project

This will be a cooperative project to be completed in small groups or pairs. Begin by selecting a specific question related to a topic, issue, or concept on teaching and learning discussed during the course. Develop the chosen topic based on your own thoughts, impressions, and experiences and view it from multiple perspectives (be sure to include your observational fieldwork). Cite from the literature (e.g. books, professional journals and magazines, and websites) to help clarify and broaden your analysis. For example, you may wish to analyse various theories of learning, such as those of Piaget or Vygotsky, and what you feel are their implications for teaching and learning. Alternatively, you could discuss how enhancing emotional intelligence can maximize learning. Include accounts based upon your own personal and observational experiences. Another option is to delve into the psychology of standardized testing and the impact it has on teacher and student motivational levels.

Whatever topic you choose, make sure that it intrigues and excites you, has some kind of educational psychology perspective, and supports your growth and progress as a teacher.

Assignment 4: Observational fieldwork and reflective notes

This assignment requires at least 10 hours of observational fieldwork at schools in classes 1–8. Fieldwork must be planned ahead of visits; be sure to discuss your plans and what you hope to accomplish with your cooperating classroom teacher. The cooperating teacher must certify your 10 hours of observation at the end of the semester. Please keep a journal about your school visits in which you can record your responses, interactions, and reflections.

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Educational psychology material and resources

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Critique of multiple intelligences theory

Although educators who support active learning strategies for children with differing learning needs have found Gardner's work on multiple intelligences to be helpful, it has not been thoroughly critiqued. There are many researchers who support active learning, but who do not support Gardner's theory. A rich collection of materials that can help you critique the work are available online and include:

- The Theory of Multiple Intelligences' by Lynn Gilman
  - http://www.indiana.edu/~intell/mitheory.shtml
- 'Theory of Multiple Intelligences'
  - http://en.wikipedia.org/wiki/Theory_of_multiple_intelligences

Student Teachers need to be reminded that Gardner's work is a descriptive theory based on his assumptions.

Sample assessment rubrics

The following rubric can be used to grade Student Teachers' performances. An alternative version is available at

➢ http://dnowlan.ca/VM/science7/Ecology/Concept%20Rubric.htm

Criteria	Beginner	Progressing	Proficient	Expert
	1	2	3	4
Use of resources	The prospective teacher has poorly demonstrated the skill of using appropriate and authentic resources in significant and insightful ways. The prospective teacher has poorly considered the university's academic honesty policies, which include policies on cheating, plagiarism, and recycling.	The prospective teacher has demonstrated some skill of using appropriate and authentic resources in significant and insightful ways. The prospective teacher has shown some consideration of the university's academic honesty policies, which include policies on cheating, plagiarism and recycling.	The prospective teacher has demonstrated a high level of skill of using appropriate and authentic resources in significant and insightful ways. Most of the time the prospective teacher has considered the university's academic honesty policies, which include policies on cheating, plagiarism, and recycling.	The prospective teacher has demonstrated an outstanding skill of using appropriate and authentic resources in significant and insightful ways. The prospective teacher has also consistently considered the university's academic honesty policies, which include policies on cheating, plagiarism, and recycling.
Development of points	The prospective teacher has poorly highlighted relevant and well-developed points through authentic literature sources, examples, or illustrations. The prospective teacher has stated some of his or her own analysis of the concepts and shown their implementation in the workplace setting.	Quite often, the prospective teacher has highlighted relevant and well-developed points through authentic literature sources, examples, or illustrations. The prospective teacher has stated his or her own analysis of the concepts and shown their implementation in the workplace setting quite skilfully.	Most of the time, the prospective teacher has highlighted relevant and well-developed points through authentic literature sources, examples, or illustrations. The prospective teacher has also stated his or her own analysis of the concepts very well and shown their implementation in the workplace setting.	The prospective teacher has highlighted relevant and well-developed points through authentic literature sources, examples, or illustrations. The prospective teacher has also stated his or her own analysis of the concepts in an expert manner and shown their implementation in the workplace setting.
Presentation	The prospective teacher has presented the work using the given format (i.e. font, writing style, margins, spacing, etc.) with many mistakes.	The prospective teacher has presented the work using the given format (i.e. font, writing style, margins, spacing, etc.) with some mistakes.	The prospective teacher has presented the work using the given format (i.e. font, writing style, margins, spacing, etc.) with very few mistakes.	The prospective teacher has presented the work using the given format (i.e. font, writing style, margins, spacing, etc.) with no mistakes.

Adapted from: M.Ed.Lead courses taught at Notre Dame Institute of Education (NDIE), Karachi. Used with permission.
For educational purposes only.

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Methods and strategies to use in planning

The following is a list of some of the strategies used in this course to encourage active learning.

Active lecturing. An active lecture is not too different from any good lecture, but it attempts to directly involve listeners.

There is no one best way to give an active lecture, but it involves any of the following techniques.

Give information in small chunks (about 10 minutes), and then have class members do something with that information for a few minutes. Here are some examples of activities, which you can repeat or vary:

- Write a one-minute reaction to what you have just heard.
    - Talk to the person next to you about what you heard and see how your perspectives differ. Do you agree? Do you have questions?
- List as many key points as you can remember.
- Compare notes taken during the chunk. Help each other fill in gaps or determine if crucial information is missing. (Some people do not allow note taking during the lecture, but this is up to the Instructor.)

Give out cards or slips of paper in three different colours. When class members are listening to your comments, have them hold up a colour for 'I understand', 'I don't understand', or 'I disagree'. Then either stop and allow questions or adjust what you are saying so there are more 'understand' colours showing. This is particularly effective with large groups of 50 or more people.

Ambassadors. This is a useful way to get groups or individuals to exchange information. Two or more members move from one group to another to share/compare discussion etc. You may wish to have half of each group move to another group. This is especially useful if you do not have ample time for a whole-class discussion.

Brainstorming. This is a technique for generating creative ideas on a topic. It may be an individual activity or organized as a group activity. Give people a limited amount of time (e.g. one minute) to say or write as many ideas as they can on a topic. No matter how unrelated an idea seems, write it down. (Alternatively, the Instructor might ask the whole class to brainstorm and write all the ideas on the board.) After the brief period of brainstorming, ideas may then be analysed, organized, and discussed. This is often used as a problem-solving technique. Ideas are then analysed in light of how useful they might be in solving the problem.

Gallery walk. This is a strategy that borrows its name from a visit to an art gallery. Students walk through an exhibit of posters, artefacts, or display of items they have completed. They can be directed to take notes. The idea is to thoughtfully look at what is displayed.

Graffiti wall. A graffiti wall may be displayed in the classroom for use all term. Students may write their thoughts, feelings, or expressions before or following each session and sign their name. Anonymous comments are not suitable. Ideas generated in class may

be posted on the 'wall'. Use paper from a large roll of craft or newsprint paper or join several cardboard boxes together to make a wall that can be stored between sessions. Students can take turns getting and putting away the wall each session.

Group work: some tips for forming instructional groups. There is no one best way to form groups. The best way for you is the way that suits your purpose. Use a more complicated strategy if students need a break or need to be energized. Use a simple technique if time is short. Ways to form groups include the following:

- Ask people to count off from one to five (depending on the number of people you want in a group). Groups will form based on their number (e.g. all of the ones will gather together).
- Before class, determine how many people you want in a group or how many groups you need. Give each class member a different coloured sticker, star, or dot as they enter the class. Then when it is time to form groups, ask them to find people with the same sticker etc. and sit together.
- Put different coloured bits of paper in a cup or jar on each table. Have people take one and find people in the room with the same colour to form a group.
- Have students get together with everybody born in the same month as they were. Make adjustments to the groups as needed.

Mini-lecture. A mini-lecture contains all the components of a good lecture. It is sharply focused. It begins with an introduction that provides an overview of what you will talk about. It offers examples and illustrations of each point. It concludes with a summary of the main point(s).

One-minute paper. Ask class members to write for one minute on a particular topic (e.g. their reflections on a topic, an assigned subject). They are to focus on writing their ideas, without worrying about grammar and spelling. A one-minute paper differs from brainstorming because there is more focus.

Pair-share. Use this technique when you want two class members to work together to share ideas or accomplish a task. Simply ask them to work with a neighbour or have them find a partner based on some other criteria. It is very useful when you want people to quickly exchange ideas without disrupting the flow of the class. (Sharing in triads and foursomes are also small group techniques.)

Poster session. This is useful when you want students to organize their thoughts on a topic and present it to others in a quick but focused way. Have individuals or small groups work to create a poster to explain or describe something. For example, if they have been doing an inquiry on a particular topic, they would want to include their focus, methods, and outcomes, along with colourful illustrations or photographs. The poster can be self-explanatory or students can use it to explain their work. As an in-class tool, a poster session is often combined with a gallery walk so that the class may review a number of posters in a short time.

Readers' theatre. readers' theatre is a group dramatic reading from a text. Readers take turns reading all or parts of a passage. The focus is on oral expression of the part being read rather than on acting and costumes. readers' theatre is a way to bring a text to life.

It is a good idea to go over passages to be read aloud with students so they are familiar with any difficult words.

Sometimes readers' theatre is used to get student interested in a text. They hear passages read first and then read the longer text.

KWL. This is a strategy that provides a structure for recalling what students know (K) about a topic, noting what students want to know (W), and finally listing what has already been learned and is yet to be learned (L).

The KWL strategy allows students to take inventory of what they already know and what they want to know. Students can categorize information about the topic that they expect to use as they progress through a lesson or unit.

Text-against-text. This is a way of helping students learn to analyse and compare written documents. The idea is to look at two documents and search for overlap, confirmation, or disagreement. It is a way of looking at different perspectives. Sometimes it is useful to give students readings prior to class and ask them to compare the readings based on a set of study questions, such as:

1. Look at each author separately. What do you think the author's main point is?
2. How does the author support his/her argument?
3. Look at the authors together. In what ways do the authors agree?
4. What are their points of disagreement?
5. What is your opinion on the issue?

Text-against-text may be used to compare a new reading or new information with material that has already been covered.

In classrooms where the whole class uses a single textbook, Instructors often find they are teaching against what is in the textbook. Sometimes it is hard for students to accept that a textbook can and should be questioned. Putting together a text-against-text activity using the textbook and outside materials (e.g. an article) can help them understand that there are legitimate differences of opinion on a subject. Articles need not contradict each other. They may be about the same topic, but offer students different ways of seeing a subject.

Another way to use the activity is divide the class into groups, give each a set of materials, and have them debate the texts. Some university faculty like to put together text sets that include both scholarly and non-scholarly works and have students think about differences. For example, you might provide all students – regardless of their reading level or learning style – with easy-to-read materials as a way to introduce themselves to a topic. Even competent adult learners seek out 'easy' books or materials to learn about a new or complex topic. Providing a picture, newspaper article, or even a children's book in a text set might give everyone the means of connecting to or understanding some aspect of the larger subject.

Roundtable technique. For this technique, divide the class into small groups (i.e. four to six people), with one person appointed as the recorder. A question that has many possible answers is posed, and class members are given time to think about the answers. After the thinking period, members of the team share their responses with one another. The recorder writes the group's answers. The person next to the recorder starts and each person in the group (in order) gives an answer until time is called.

Quizzes. Prepare and give a short quiz (15 minutes) over the different aspects of child development covered in the unit. As students take the quiz, ask them to circle items they are unsure of. They can review and discuss their work in the following ways:

- **Triads**. Have students meet in groups of three to review the quizzes so that they can help each other with their weak areas. (10 minutes)
- **Review**. Go over the quiz with students, and have them look at their own work and make corrections. (30 minutes)
    - Notice points class members had difficulty remembering and take time to review them. You may ask students to assist with this and discuss how they were able to remember.
    - Use this time to correct any misconceptions.
    - Have students save their quiz for future study.

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Articles and readings

Reading 1

Individual Differences

An entry for the Encyclopedia of Psychology (in press)
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That people differ from each other is obvious. How and why they differ is less clear and is the subject of the study of Individual differences (IDs). Although to study individual differences seems to be to study variance, how are people different, it is also to study central tendency, how well can a person be described in terms of an overall within-person average. Indeed, perhaps the most important question of individual differences is whether people are more similar to themselves over time and across situations than they are to others, and whether the variation within a single person across time and situation is less than the variation between people. A related question is that of similarity, for people differ in their similarities to each other. Questions of whether particular groups (e.g., groupings by sex, culture, age, or ethnicity) are more similar within than between groups are also questions of individual differences.

Personality psychology addresses the questions of shared human nature, dimensions of individual differences and unique patterns of individuals. Research in IDs ranges from analyses of genetic codes to the study of sexual, social, ethnic, and cultural differences and includes research on cognitive abilities, interpersonal styles, and emotional reactivity. Methods range from laboratory experiments to longitudinal field studies and include data reduction techniques such as Factor Analysis and Principal Components Analysis, as well as Structural Modeling and Multi-Level Modeling procedures. Measurement issues of most importance are those of reliability and stability of Individual Differences.

Research in Individual Differences addresses three broad questions: 1) developing an adequate descriptive taxonomy of how people differ; 2) applying differences in one situation to predict differences in other situations; and 3) testing theoretical explanations of the structure and dynamics of individual differences.

Taxonomies of individual differences:

Taxonomic work has focused on categorizing the infinite ways in which individuals differ in terms of a limited number of latent or unobservable constructs. This is a multi-step, cyclical process of intuition, observation, deduction, induction, and verification that has gradually converged on a consensual descriptive organization of broad classes of variables as well as on methods for analyzing them. Most of the measurement and taxonomic techniques used throughout the field have been developed in response to the demand for selection for schooling, training, and business applications.

Test Theory

Consider the case of differences in vocabulary in a particular language (e.g., English). Although it is logically possible to organize people in terms of the specific words they know in English, the more than 2^(500,000) possible response patterns that could be found by quizzing people on each of the more than 500,000 words in English introduces more complexity rather than less. Classical Test Theory (CTT) ignores individual response patterns and estimates an individual's total vocabulary size by measuring performance on small samples of words. Words are seen as random replicates of each other and thus individual differences in total vocabulary size are estimated from observed differences on these smaller samples. The Pearson Product Moment Correlation Coefficient (r) compares the degree of covariance between these samples with the variance within samples. As the number of words sampled increases, the correlation of the individual differences within each sample and with those in the total domain increases accordingly.

Estimates of ability based upon Item Response Theory (IRT) take into account parameters of the words themselves (i.e., the difficulty and discriminability of each word) and estimate a single ability parameter for each individual. Although CTT and IRT estimates are highly correlated, CTT statistics are based on decomposing the sources of variance within and between individuals while IRT statistics focus on the precision of an individual estimate without requiring differences between individuals. CTT estimates of reliability of ability measures are assessed across similar items (internal consistency), across alternate forms, and across different forms of assessment as well as over time (stability). Tests are reliable to the extent that differences within individuals are small compared to those between individuals when generalizing across items, forms, or occasions. CTT reliability thus requires between subject variability. IRT estimates, on the other hand, are concerned with the precision of measurement for a particular person in terms of a metric defined by item difficulty.

The test theory developed to account for sampling differences within domains can be generalized to account for differences between domains. Just as different samples of words will yield somewhat different estimates of vocabulary, different cognitive tasks (e.g., vocabulary and arithmetic performance) will yield different estimates of performance. Using multivariate procedures such as Principal Components Analysis or Factor Analysis, it is possible to decompose the total variation into between domain covariance, within domain covariance, and within domain variance. One of the most replicable observations in the study of individual differences is that almost all tests thought to assess cognitive ability have a general factor (g) that is shared with other tests of ability. That is, although each test has specific variance associated with content (e.g., linguistic, spatial), form of administration (e.g., auditory, visual), or operations involved (e.g., perceptual speed, memory storage, memory retrieval, abstract reasoning), there is general variance that is common to all tests of cognitive ability.

Personality and Ability

Although to some the term personality refers to all aspects of a person's individuality, typical usage divides the field into studies of ability and personality. Tests of ability are viewed as maximal performance measures. Ability is construed as the best one can do on a particular measure in a limited time (speed test) or with unlimited

time (power test). Personality measures are estimates of average performance and typically include reports of preferences and estimates of what one normally does and how one perceives oneself and is perceived by others.

The same procedures used to clarify the structure of cognitive abilities have been applied to the question of identifying the domains of personality. Many of the early and current personality inventories use self-descriptive questions (e.g., do you like to go to lively parties; are you sometimes nervous) that are rationally or theoretically relevant to some domain of interest for a particular investigator. Although there is substantial consistency across inventories developed this way, some of this agreement could be due to conceptually overlapping item pools. Other researchers have advocated a lexical approach to the taxonomic problem, following the basic assumption that words in the natural language describe all important individual differences. This shifts the taxonomic question from how are individuals similar and different from each other to how are the words used to describe individuals (e.g., lively, talkative, nervous, anxious) similar and different from each other.

Dimensional analyses of tests developed based on lexical, rational, or theoretical bases suggest that a limited number (between three and seven) of higher order trait domains adequately organize the thousands of words that describe individual differences and the logically infinite way that these words can be combined into self or peer report items. The broadest domains are those of introversion-extraversion and emotional stability-neuroticism, with the domains of agreeableness, conscientiousness and intellectual openness or culture close behind. These domains can be seen as asking the questions that one wants to know about a stranger or a potential mate: are they energetic and dominant (extraverted), emotionally stable (low neurotic), trustworthy (conscientious), loveable (agreeable), and interesting (intelligent and open).

Measures of ability and personality reflect observations aggregated across time and occasion and require inferences about stable latent traits thought to account for the variety of observed behaviors. However there are other individual differences that are readily apparent to outside observers and require little or no inference about latent traits. The most obvious of such variables include sex, age, height, and weight. Differences that require some knowledge and inference are differences in ethnicity and social economic status. These obvious group differences are sometimes analyzed in terms of the more subtle measures of personality and ability or of real life outcomes (e.g, sex differences in neuroticism, mathematics ability, or income).

Predictive Validity

Individual differences are important only to the extent that they make a difference. Does knowing that people differ on a trait X help in predicting the likelihood of their doing behavior Y? For many important outcome variables the answer is a resounding yes. In their review of 85 years of selection in personnel psychology, Frank Schmidt and John Hunter (Psychological Bulletin, 1998, 124, 262-274) show how differences in cognitive ability predict differences in job performance with correlations averaging about .50 for mid complexity jobs. These correlations are moderated by job complexity and are much higher for professional-managerial positions than they are for completely unskilled jobs. In terms of applications to personnel psychology,

a superior manager (one standard deviation above the mean ability for managers) produces almost 50% more than an average manager. These relationships diminish as a function of years of experience and degree of training. General mental ability (g) also has substantial predictive powers in predicting non-job related outcomes, such as likelihood of completing college, risk for divorce and even risk for criminality.

The non-cognitive measures of individual differences also predict important real life criteria. Extraversion is highly correlated with total sales in dollars among salespeople. Similarly, impulsivity can be used to predict traffic violations. Conscientiousness, when added to g substantially increases the predictability of job performance. Although the size of the correlation is much lower, conscientiousness measured in adolescence predicts premature mortality over the next fifty years.

Sources of individual differences

The taxonomic and predictive studies of individual differences are descriptive organizations of thoughts, feelings, and behaviors that go together and how they relate to other outcomes. But this categorization is descriptive rather than causal and is analogous to grouping rocks in terms of density and hardness rather than atomic or molecular structure. Causal theories of individual differences are being developed but are in a much earlier stage than are the descriptive taxonomies.

Descriptive taxonomies are used to organize the results of studies that examine genetic bases of individual differences. By applying structural modeling techniques to the variances and covariances associated with various family constellations it is possible to decompose phenotypic trait variance into separate sources of genetic and environmental variance. The most common family configurations that are used are comparisons of identical (monozygotic) with fraternal (dizygotic) twins. Additional designs include twins reared together or apart, and biological versus adoptive parents, children and siblings. Conclusions from behavioral genetics for most personality traits tend to be similar: Across different designs, with different samples from different countries, roughly 40-60% of the phenotypic variance seems to be under genetic control with only a very small part of the remaining environmental variance associated with shared family environmental effects. Additional results suggest that genetic sources of individual differences remain important across the lifespan. However, this should not be taken to mean that people do not change as they mature but rather that the paths one takes through life are similar to those taken by genetically similar individuals.

Genes do not code for thoughts, feelings or behavior but rather code for proteins that regulate and modulate biological systems. Although promising work has been done searching for the biological bases of individual differences it is possible to sketch out these bases only in the broadest of terms. Specific neurotransmitters and brain structures can be associated with a broad class of approach behaviors and positive affects while other neurotransmitters and structures can be associated with a similarly broad class of avoidance behaviors and negative affects. Reports relating specific alleles to specific personality traits emphasize that the broad personality traits are most likely under polygenic influence and are moderated by environmental experience.

Subtle differences in neurotransmitter availability and re-uptake vary the sensitivity of individuals to cues about their environment that predict future resource availability and external rewards and punishments. It is the way these cues are detected, atttended to, stored, and integrated with previous experiences that makes each individual unique. Current work on the bases of individual differences is concerned with understanding this delicate interplay of biological propensities with environmental opportunities and constraints as they are ultimately represented in an individual's information processing system. With time we can expect to increase our taxonomic and predictive power by using these causal bio-social theories of individual differences.

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Reading 2

Individual Differences and Differential Psychology: A brief history and prospect

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Differential psychology has been a central concern to philosophers and psychologists, both applied and theoretical, for the past several millennia. It remains so today. he proper study of individual differences integrates methodology, affective and cognitive science, genetics and biology. It is a field with a long history and an exciting future. We review some of the major questions that have been addressed and make suggestions as to future directions.

This handbook is devoted to the study of individual differences and differential psychology. To write a chapter giving an overview of the field is challenging, for the study of individual differences includes the study of affect, behavior, cognition, and motivation as they are affected by biological causes and environmental events. That is, it includes all of psychology. But it is also the study of individual differences that are not normally taught in psychology departments. Human factors, differences in physical abilities as diverse as taste, smell, or strength are also part of the study of differential psychology. Differential psychology requires a general knowledge of all of psychology for people (as well as chimpanzees, dogs, rats and fishes) differ in many ways. Thus, differential psychologists do not say that they are cognitive-psychologists, social-psychologists, neuro-psychologists, behavior geneticists, psychometricians, or methodologists, for although we do those various hyphenated parts of psychology, by saying we study differential psychology, we have said we do all of those things. And that is true for everyone reading this handbook. We study differential psychology. Individual differences in how we think, individual differences in how we feel, individual differences in what we want and what we need, individual differences in what we do. We study how people differ and we also study why people differ. We study individual differences.

There has been a long recognized division in psychology between differential psychologists and experimental psychologists (Cronbach, 1957; H. J. Eysenck, 1966), however, the past 30 years has seen progress in integration of these two approaches (Cronbach, 1975; H. J. Eysenck, 1997; Revelle & Oehleberg, 2008). Indeed, one of the best known experimental psychologists of the 60's and 70's argued that "individual differences ought to be considered central in theory construction, not peripheral" (Underwood, 1975, p 129). However, Underwood (1975) went on to argue (p 134) that these individual differences are not the normal variables of age, sex, IQ or social status, but rather are the process variables that are essential to our theories. Including these process variables remains a challenge to differential psychology.

The principles of differential psychology are seen outside psychology in computer science simulations and games, in medical assessments of disease symptymatology, in college and university admissions, in high school and career counseling centers, as well as in applied decision making.

Early Differential Psychology and its application

Differential psychology is not new for an un- derstanding of research methodology and individ- ual differences in ability and affect was described as early as the Hebrew Bible in the story of Gideon (Judges 6, 7). Gideon was something of a skeptic who had impressive methodological sophistication. In perhaps the first published example of a repeated measures, cross over design, he applied several behavioral tests to God before agreeing to go off to fight the Midians as instructed. Gideon put a wool fleece out on his threshing floor and first asked that by the next morning just the fleece should be wet with dew but the floor should be left dry. Then, the next morning, after this happened, as a cross over control, he asked for the fleece to be dry and the floor wet. Observing this double dissociation, Gideon decided to follow God's commands. We believe that this is the first published example of the convincing power of a cross over interaction. (Figure 1 has been reconstructed from the published data.)

In addition to being an early methodologist, Gideon also pioneered the use of a sequential assessment battery. Leading a troop of 32,000 men to attack the Midians, Gideon was instructed to reduce the set to a more manageable number (for greater effect upon achieving victory). To select 300 men from 32,000, Gideon (again under instructions from God) used a two part test. One part measured motivation and affect by selecting those 10,000 who were not afraid. The other measured crystallized intelligence, or at least battlefield experience, by selecting those 300 who did not lie down to drink water but rather lapped it with their hands (McPherson, 1901).

Gideon thus combined many of the skills of a differential psychologist. He was a methodologist skilled in within subject designs, a student of affect and behavior as well as familiar with basic principles of assessment. Other early applications of psychological principles to warfare did not emphasize individual differences so much as the benefits of training troops of a phalanx (Thucydides, as cited by Driskell & Olmstead, 1989).

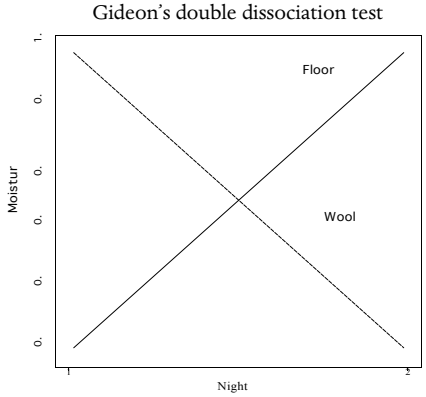

Figure 1. Gideon's tests for God are an early example of a double dissociation and probably the first published example of a cross over interaction. On the first night, the wool was wet with dew but the floor was dry. On the second night, the floor was wet but the wool was dry (Judges 6:36-40)

Personality taxonomies

That people differ is obvious. How and why they differ is the subject of taxonomies of personality and other individual differences. An early and continuing application of these taxonomies is most clearly seen in the study of leadership effectiveness. Plato's discussion of the personality and ability characteristics required for a philosopher king emphasized the multivariate problem of the rare cooccurence of appropriate traits:

> ... quick intelligence, memory, sagacity, cleverness, and similar qualities, do not often grow together, and that persons who possess them and are at the same time high-spirited and magnanimous are not so constituted by nature as to live orderly and in a peaceful and settled manner; they are driven any way by their impulses, and all solid principle goes out of them. ...
>
> On the other hand, those steadfast natures which can better be depended upon, which in a battle are impregnable to fear and immovable, are equally immovable when there is anything to be learned; they are always in a torpid state, and are apt to yawn and go to sleep over any intellectual toil. ... And yet we were saying that both qualities were necessary in those to whom the higher education is to be imparted, and who are to share in any office or command. (Plato, 1991, book 6)

Similar work is now done by Robert Hogan and his colleagues as they study the determinants of leadership effectiveness in management settings (Hogan, 2007, 1994; Hogan et al., 1990; Padilla et al., 2007) as well as one of the editors of this volume, Adrian Furnham (Furnham, 2005). The dark side qualities discussed by Hogan could have been taken directly from The Republic.

A typological rather than dimensional model of individual differences was developed by Theophrastus, a student of Aristotle, who was most famous as a botanical taxonomist. However, he is known to differential psychologists as a personality taxonomist who organized the individual differences he observed into a descriptive taxonomy of "characters". The characters of Theophrastus are often used to summarize the lack of coherence of early personality trait description, although it is possible to organize his "characters" into a table that looks remarkably similar to equivalent tables of the late 20th century (John, 1990; John & Srivastava, 1999).

1600 years after Theophrastus, Chaucer added to the the use of character descriptions in his "Cantebury Tales" which are certainly the first and probably the "best sequence of 'Characters' in English Literature" (Morley, 1891, pg 2). This tradition continued into the 17th century where the character writings of the period are fascinating demonstration of the broad appeal of personality description and categorization (Morley, 1891).

Causal theories

Tyrtamus of Lesbos, who was known as Theophrastus for his speaking ability, (Morley, 1891), asked a fundamental question of personality theory that is still of central concern to us today:

> Often before now have I applied my thoughts to the puzzling question – one, probably, which will puzzle me for ever – why it is that, while all Greece lies under the same sky and all the Greeks are educated alike, it has befallen us to have characters so variously constituted.

This is, of course, the fundamental question asked today by differential psychologists who study behavior genetics (e.g., Bouchard, 1994, 2004) when they address the relative contribution of genes and shared family environment as causes of behavior.

Biological personality models have also been with us for more than two millenia, with the work of Plato, Hippocrates and later Galen having a strong influence. Plato's organization of the tripartite soul into the head, the heart and the liver (or, alternatively, reason, emotion and desire) remains the classic organization of the study of individual differences (Hilgard, 1980; Mayer, 2001; Revelle, 2007). Indeed, with the addition of behavior, the study of psychology may be said to be the study of affect (emotion), behavior, cognition (reason) and motivation (desire) as organized by Plato (but without the physical localization!).

500 years later, the great doctor, pharmacologist and physiologist, Galen (129-c.a. 216) organized and extended the earlier literature of his time, particularly the work of Plato and Hippocrates (c 450-380 BCE), when he described the causal basis of the four temperaments. His empirical work, based upon comparative neuroanatomy, provided support for Plato's tripartite organization of affect, cognition, and desire. Although current work does not use the same biological concepts, the search for a biological basis of individual differences continues to this day.

1800 years later, Wilhelm Wundt (Wundt, 1874,1904) reorganized the Hippocrates/Galen four temperaments into the two dimensional model later discussed by Hans Eysenck (H. J. Eysenck, 1965, 1967) and Jan Strelau (Strelau, 1998).

Early methodology

Besides the introduction of the cross over experiment by Gideon, Plato introduced two important concepts that would later find in an important role in psychometrics and the measurement of individual differences. The concept of True Score and of the distinction between observed and latent variables may be found in the Allegory of the Cave (Plato, 1991, Book 7). For just as the poor prisoners chained in the cave must interpret the world in terms of the shadows cast on the wall, so must psychometricians interpret individual differences in observed score as reflecting latent differences in True score. Although shadow length can reflect differences in height, it can also reflect differences in distance from the light. For the individual differences specialist, making inferences about true score changes based upon observed score differences can be problematic. Consider the increases in observed IQ scores over time reported by Flynn (1984, 1987, 2000), termed the Flynn effect. It may be asked, is the Flynn effect a real effect, and are people getting smarter, or are

the IQ scores going up equivalent to a change in shadow length in the cave, due to a change in position but not of height in the realworld? This inferential problem is also seen in interpretations of fan-fold interactions as reflecting interactions at the latent level rather than merely at the observed level (Revelle, 2007).

Table 1

The characters of Theophrastus and the adjectives of the Big 5 show remarkable similarity. Big 5 adjectives from John (1990). The characters of Theophrastus are from Jebb's translation of Theophrastus (1909).

Extraversion	Agreeableness	Conscientious	Neuroticism	Openness
talkative	sympathetic	organized	tense	wide interests
assertive	kind	thorough	anxious	imaginative
active	appreciative	planful	nervous	intelligent
energetic	affectionate	efficient	moody	original
-quiet	-cold	-careless	-stable	-commonplace
-reserved	-unfriendly	-disorderly	-calm	-simple
-shy	-quarrelsome	-frivolous	-contented	-shallow
-silent	-hard-headed	-irresponsible	-unemotional	-unintelligent
talker	anxious to please	hostile	coward	stupid
chatty	flatterer	shameless	grumbler	superstitious
boasful	unpleasant	distrustful		boor
ironical	feckless	slanderer		offensive
petty ambition	tiresome	penurious	mean	gross
arrogant	outcast	avaricious		
garrulous	complaisant	Reckless		
gossipy	surley	officious	unseasonable	
oligarch	evil speaker	patron of rascals		

Table 2

Greek/Roman causal theory of personality

Physiological Basis	Temperament
Yellow Bile	Choleric
Phlegm	Phlegmatic
Blood	Sanguine
Black Bile	Melancholic

Table 3

Wundt's two dimensional organization of the four temperaments

Changeability	Exciteability
Melancholic	Choleric
Phlegmatic	Sanguine

Differential Psychology in the Late 19th and early 20th centuries

Any discussion of differential psychology must include the amazing contributions of Sir Francis Galton. Besides considering the hereditary basis of ability (Galton, 1865, 1892), or describing the results of an introspective analysis of the complexity of his own thoughts (Galton, 1879), or introducing the lexical hypothesis later made popular by Goldberg (1990) by searching the thesaurus for multiple examples of character (Galton, 1884) he also developed an index of correlation in terms of the product of deviations from the median and the probable error of the estimate (Galton, 1888; Stigler, 1989). His measure of "reversion to the mean" was later modified to the form we now know as the Pearson Product Moment Correlation Coefficient (Pearson, 1896).

Galton believed in the power of data analysis, whether it was developing meteorological maps of Europe, the use of fingerprints for identification, or the dimensions of character (Galton, 1884)

> ... character ought to be measured by carefully recorded acts, representative of the usual conduct. An ordinary generalization is nothing more than a muddle of vague memories of inexact observations. It is an easy vice to generalize. We want lists of facts, every one of which may be separably verified, valued and revalued, and the whole accurately summed. It is the statistics of each man's conduct in small everyday affairs, that will probably be found to give the simplest and most precise measure of his character. ... a practice of deliberately and methodically testing the character of others and of ourselves is not wholly fanciful, but deserves consideration and experiment. (Galton, 1884, p 185)

Expanding upon the work of Galton, Charles Spearman, in a remarkable pair of papers in 1904, introduced the correlation coefficient to psychologists as well as the concept of reliability and corrections for attenuation (Spearman, 1904b).

> Psychologists, with scarcely an exception, never seem to have become acquainted with the brilliant work being carried on since 1886 by the Galton-Pearson school. The consequence has been that they do not even attain to the first fundamental requisite of correlation, namely a precise quantitative expression. (Spearman, 1904b, p 96)

In the next issue of the same journal, he then introduced factor analysis and suggested a general factor of ability (Spearman, 1904a). More than a century after these papers, much of differential psychology may be seen as a footnote to the work of Galton and Spearman.

The research of Gerard Heymans (1906) in the Netherlands unfortunately has not received the attention it deserves among American psychologists, for it is a classic set of studies on the structure of individual differences based upon observer ratings. Eysenck presented a very thorough review of Heymans work (H. J. Eysenck, 1992), as has Strelau (1998). van der Werff & Verster (1987) were reanalyzed the data using principal components analysis. Over 3,000 physicians were asked to rate the mem- bers of one family on six types of items. About 400 physicians responded. Strelau summarizes the results in terms of temperamental dimensions of activity, emotionality, and 'primary vs. secondary functioning'. This later dimension may be taken as related to the temporal aspects of behavior and the speed of switching between activities (see Atkinson & Birch (1970); Fua et al. (2010) for a consideration of the temporal component). The original data have been reanalyzed by van der Werff & Verster (1987) and included 90 questions referring to 2,309 members of 437 families. A five and three component solution were obtained. The components represented impulsivity versus thoughtfulness, activity (with two sub components of continuous activity and not easily daunted) and a component of 'bad temper' with items of trusting and unselfish versus imperious and irritable. Strelau (1998) gives these important studies the respect they deserve.

The early 20th century also saw the introduction of the IQ test (Binet & Simon, 1905; Goddard, 1908; Terman, 1916), the hypothesis of a general factor of ability (Spearman, 1904a), and the introduction of ability (the Army Alpha) and emotional testing for military selection (Driskell & Olmstead, 1989; Jones & Thissen, 2007; Yerkes, 1918). Differential psychologists involved in the Army Alpha/Beta project included Terman, Otis, Thorndike, Thurstone and Whipple (Jones & Thissen, 2007). Otis went on to develop a group intelligence scale, as did Terman. The subsequent years were active times for differential psychology, continuing on with the beginning of the landmark longitudinal study on high ability children (Terman, 1925; Terman & Oden, 1947). It was also a time in which IQ tests were used to screen (non-English speaking) immigrants at Ellis Island in the United States and to argue for forced sterilization (Zenderland, 2001) for those with low scores.

Another researcher whose work has not been as appreciated by Americans as much as it should is the work of William Stern (1910, 1914). Not only laying out a theory of differences between individuals, Stern also emphasized the study of individuality which he wanted to reclaim from historical biographers (Stern, 1910). It is interesting to note that he was well aware of the problem of errors in memory that bias self reports of any kind. His lectures should be of interest to all interested in narrative approaches to the study of individuals. Stern is most known for his work on intelligence (Stern, 1914) where he developed the measure of intelligence as the ratio of mental age to chronological age. This ratio, when multiplied by 100, of course became the IQ score used in differential psychology before the change to the use of standard scores. To Stern

> Intelligence is a general capacity of an individual consciously to adjust his thinking to new requirements: it is a general mental adaptability to new problems and conditions of life. ...
>
> Finally, the fact that the capacity is a general capacity distinguishes intelligence from talent the characteristic of which is precisely the limitation of efficiency to one kind of content. He is intelligent, on the contrary, who is able easily to effect mental adaptation to new requirements under the most varied conditions and in the most varied fields. If talent is material efficiency, intelligence is a formal efficiency (Stern, 1914, pp 3-4).

Subsequent work on the structure of ability followed the introduction of matrix algebra to Thurstone (Thurstone, 1935, 1947) and thus into psychology (Bock, 2007). With the ability to work with matrices, the process of factor analysis of correlational 'tables' became much simpler and the subsequent extraction of multiple factors of intellect more reasonable. Debates between 'g' theories (Spearman, 1946) versus multi-factor models (Thurstone,1933, 1935, 1947) versus sampling theories of intelligence (Bartholomew et al., 2009; G. H. Thomson, 1935; S. Thomson, 1951) filled the pages of journals and the shelves of libraries.

Outside of the ability domain, empirically driven test construction in the personality and interests domains proceeded with little regard to theories of underlying individual differences. This work led to the development and validation of items that could discriminate known occupational groups from people in general. The basic

model was and is that if one shares interests with those in a particular occupation, that one is more likely to do well in that occupation (Strong, 1927). Interests show strong consistencies over the lifetime (Kelly, 1955) and have moderate predictive validities. More recently, two and three dimensional structural models have been applied to the interests as measured by the Strong (Armstrong et al., 2004; Donnay, 1997). Interests in an occupation do not imply ability in that occupation (one can share interests with opera singers, but if a second monotone, unlikely to succeed).

Mid 20th Century: The high point of differential psychology?

The 1930's saw the introduction of Psychometrika, the pages of which were soon filled with detailed discussions on reliability theory, factor analysis, and scale construction. Most of the work was on measuring ability and the primary debates were between methods of factor extraction, validity estimation and a general theory of tests.

With the publication of Gordon Allport's text on personality (Allport, 1937), Henry Murray's integration of multiple approaches to the study of personality (Murray, 1938), and Clyde Kluckhohn and Murray's integration of personality with society and culture (Kluckhohn & Murray, 1948), empirical personality research had finally reached the United States.

Following the onset of the second world war, differential psychologists were soon involved in the problems of selection and training. About 1500 psychologists were associated with the Army Air Force selection and training program. The list of differential psychologists involved includes many future presidents of the Psychometric society (Jones & Thissen, 2007) and leaders in differential psycholgy. The detailed final report of the project (Dubuis, 1947) is a primer on how to do validity studies. The point biserial validities for cognitive and psychomoter tests for predicting training success for e.g., pilots, navigators and bombardiers were roughly .45 across various samples and could be presented graphically in a manner that showed the powers of selection (Figure 2).

Differential psychologists primarily associated with personality and social psychology were also involved in selection, but for a more difficult criterion. Differential psychologists assisted with the selection of agents for the Office of Strategic Services (OSS) which later became the Central Intelligence Agency. Whereas the criteria for air force pilots was clear, the criteria for success as a spy proved to be more difficult to ascertain. The predictive validities actually diminished the longer the assessment procedure lasted (OSS Assessment Staff, 1948; Wiggins, 1973).

Three more 'milestones in assessment' and prediction involving differential psychology (Wiggins, 1973) were the American Veterans Administration selection of clinical psychology graduate students in the late 1940s (Kelly & Fiske, 1951), the selection of the first American astronauts, and the selection of Peace Corps Volunteers (Wiggins, 1973).

The conclusions from the VA selection study (Kelly & Fiske, 1950) are remarkably consistent with findings reported 50 years later about predicting graduate student success Kuncel et al. (2001): A mixture of ability and objectively assessed interests and personality variables predict graduate student success with roughly equal ($\approx .25 - .30$) validities that when combined form a multiple R of about .4. More importantly

and consistent with the OSS findings, complex assessments based upon the interactions of assessors with applicants have no incremental validity. That is, people who are more able, interested in psychology, and lack nervous tension and irritability are more likely to succeed in clinical training than the less able, less interested, and more nervous. Having long interactions with an assessment board does not add information to this combination of Ability, Interests, and Temperament (AIT).

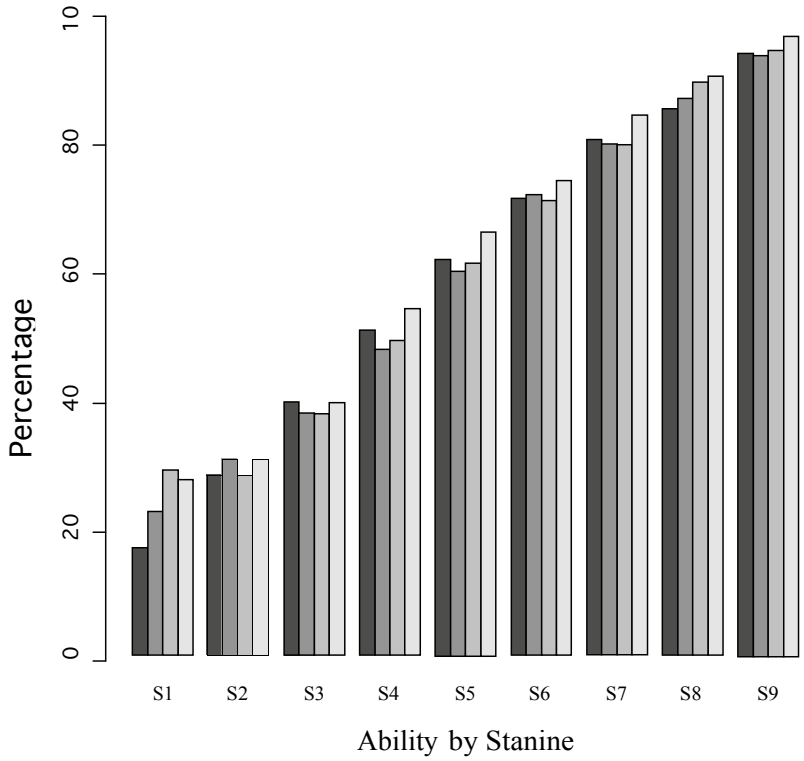

Figure 2. Success rate in the Army Airforce elementary pilot classes as a function of the ability scored in stanines. Cohorts 43 H-K. Figure adapted from tables in (Dubuis, 1947, p 119). While only about 20% of candidates with the lowest stanine succeeded, almost 95% of the top stanines did. Sample sizes in each cohort range from 9,617 to 11,010.

Theories of individual differences

The late 1940's through the mid 1960's were a major time for theorizing about individual differences. In terms of theories of intellect, Joy P. Guilford's attempt to cross three modes of thinking: operations, products, and content led to an ambitious attempt to measure 120 narrow factors of mental ability (Guilford, 1956, 1959). Each mode of thought had subcomponents such that operations could be divided into five: cognitive, memory, divergent thinking, convergent thinking and evaluation (Guilford, 1956), products could be divided into six: units, classes, relations, systems, transformations, and implications, and contents could be split into four: figural, symbolic, semantic, and behavioral.

An alternative model, suggesting a hierarchy of abilities was the fluid, crystallized, g model of ability (the g f − gc model) (Horn & Cattell, 1966) which made a distinction between processing factors (fluid) and knowledge factors (crystallized).

Raymond Cattell integrated cognitive and noncognitive personality variables when he laid out an ambitious plan to apply factor analytic methods from ability to the personality domain and commenced a long series of studies on the structure of personality (Cattell, 1943, 1946a,c,b, 1957, 1966b, 1978). To Cattell (1946c), surface traits were clusters of observations such as self reports of anxiety, crying or depression that needed be explained by source traits which could be derived from factor analysis. He elaborated the source trait distinction in terms of those that reflect ability, those that are dynamic, and those that are stable temperaments (Cattell, 1946b). Cattell (1946c) introduced the data box which emphasized that correlations can be taken over people, tests, or occasions. Although most research at the time emphasized the correlations of tests across people (R analyis), Cattell proposed to consider how people varied over tests (Q analysis) and how tests varied across time (P analysis), etc. Subsequently, Cattell (1966a) elaborated the data box into a five dimensional analysis by adding observers and background conditions. In a series of studies using peer ratings of personality as well as self reports Cattell (1957) emphasized many correlated factors of personality in what would eventually become his 16PF inventory. Reflecting his belief in the power of differential psychology and the need to integrate it with experimental psychology, Cattell was a founding member and first president of the Society for Multivariate Experimental Psychology in 1960.

The other grand theorist of individual differences was Hans Eysenck. He searched for consistency of individual differences starting using behavioral measures (H. J. Eysenck & Himmelweit, 1947) and then attempted to explain individual differences by using learning theory (H. J. Eysenck, 1952), and then subsequently arousal theory (H. J. Eysenck, 1967). By blending experimental and correlational data with the best available theory, he inspired others to study the hard question of mechanism. Never one to avoid controversy, his popular books (H. J. Eysenck, 1953, 1964, 1965) introduced the possibility of doing rigorous research in personality and individual differences to several generations of psychologists. Eysenck was a founder and first president of the International Society for the Study of Individual Differences in 1983. His contributions to the field field are discussed elsewhere in this handbook and do not need to be reviewed here.

Unlike later theorists, both Cattell and Eysenck emphasized individual differences broadly conceived. They both made contributions to the study of ability, to personality trait structure, and to psychometric methods. They attempted to integrate genetic, physiological, emotional, cognitive, and societal influences on human behavior. They both wrote prodigiously, with popular trade books as well as serious monographs and articles.

Less known to most differential psychologists were the contributions of John W. Atkinson who emphasized the interactive contribution of situational challenges and individual differences in achievement motivation. From a formal theory of risk preference (Atkinson, 1957) to a review of the effects of situational stressors on performance (Atkinson & Raynor, 1974) to a dynamic model of motivation (Atkinson & Birch, 1970), the theory of achievement motivation integrated approach and avoidance motivational tendencies. The study of achievement motivation has now been reinvigorated with the recent studies of Elliot & Church (1997) and Elliot &

Thrash (2002) who fit achievement motivation and anxiety into an approach and avoidance temperament system similar to that of Carver & White (1994); Gray (1970). Taking the expectancy-value framework even further forward is the work of Eccles & Wigfield (2002) who integrates achievement motivation with theories of goal setting and interest motivation.

Perhaps unfortunately, this period was also represented by an explosion of personality inventories. These were developed by many different research groups. Inventories were constructed using empirical (Dahlstrom, 1992; Hathaway & McKinley, 1951, MMPI), rational (Gough, 1957, CPI), (Heist & Williams, 1957; Warren & Heist, 1960, OPI), and factorial, (H. J. Eysenck & Eysenck, 1964, EPI), (Cattell & Stice, 1957, 16PF), (Comrey, 1995, CPS), (Guilford & Zimmerman, 1949, GZTZ), (Hogan & Hogan, 1995, HPI) methodologies some without any organizing theory more than alphabetical (London & Exner, 1978).

Less noticed at the time, but more recently seen as bearing some very rich fruit were a series of longitudinal studies started in the late 1920s through 1950s, e.g., Block (1971), Elder (1998), Kelly (1955), and Schaie (2005). As is true of many longitudinal studies, these were not for the faint of heart, nor for the non-sophisticated methodologist. The Oakland Growth Study and subsequent Berkeley Guidance and Berkeley Growth study have been the source of data for developmentally oriented differential psychologists for more than 70 years (Block, 1971; Elder, 1998). The Schaie (2005) studies, for example involved multiple cohorts sampled every 5-7 years for what is now more than 50 years. The early findings from these studies has matched the later results: ability, interests, and temperament are very stable over decades. Although there is some change, and character is not locked in cement, it is much more stable than had been thought (Roberts & DelVecchio, 2000).

Late 20th Century

Unfortunately, in the mid 1960's, after the proven successes of differential psychologist predicting important criteria, there was a turn away from the study of individual differences, particularly in the United States. Personality trait theory came under attack as a study of small, non-replicable effects with no agreement about the proper structural representation of personality. The research emphasis in American psychology switched to situational explanations of behavior. Studies of ability were attacked as being elitist, racist, or exclusionary. Personality researchers no longer routinely included ability measures in their studies and were not trained in the measurement of ability. Studies of occupational interests and job performance were seen as applied problems not of interest to the pages of the top journals. Exceptions to this generalization were of course the superb integrative text by H. J. Eysenck & Eysenck (1985) and a text on individual differences by Willerman (1979). The research emphasis became one of 'personality x situation interactions' which had, of course, been well studied by Atkinson (1957); Cattell (1957) and H. J. Eysenck (1967) for many years.

Consensual descriptive taxonomies of personality

Eventually, after what some of us in the United States refer to as the 'dark ages' (1968–1990), personality and differential psychology became an active area of research again. This was partly because the European emphasis upon biological

bases of personality (e.g., H. J. Eysenck (1967); Strelau & Eysenck (1987)) answered the situational attack, partly because the growing evidence for genetic bases of most individual differences (Bouchard, 1994; Plomin et al., 1994) and partly because of growing consensus about the descriptive dimensions of personality. For in the intervening years, there had been consistent evidence that a limited number of personality traits could be consistently identified in peer ratings and self reports (Fiske, 1949; Norman, 1963, 1969; Tupes & Christal, 1961) and that most self report inventories included some but not necessarily all of these so-called 'Big 5' dimensions. (Digman, 1990; Goldberg, 1990). Two of these dimensions (extraversion and neuroticism) clearly matched the biologically based taxonomies of H. J. Eysenck (1967), two (agreeableness and conscientiousness) seemed to represent a splitting of what H. J. Eysenck (1990) had labeled psychoticism or tough mindedness, and an additional dimension of intellectual interests and openness to new experiences blended ability with approach motivation. Following a number of influential meta analyses showing that personality and ability variables did indeed have predictive validity in occupational settings (Barrick & Mount, 1991; Mount et al., 2005) and that characteristics of bad leadership that were a threat to organizational effectiveness could be identified by self report (Hogan, 1994; Hogan et al., 1990), individual differences research became respectable again.

Subsequent work discussing blends of the Big 5 (Hofstee et al., 1992a; J. A. Johnson & Ostendorf, 1993) continued the atheoretic tradition of the descriptive taxonomies, but did show how three biological dimensions (the 'Giant 3') could be related to five descriptive dimensions. The development of a standard instrument (the Neuroticism-Extraversion-Openness Personality Inventory, Revised or NEO-PI, Costa & McCrae (1985)) to measure the 'Big 5' trait dimensions certainly helped as did the forceful reviews by Costa & McCrae (1992a), (McCrae & Costa, 1997) and McCrae & Costa (1999).

Consensual structure of intelligence

On the abilities front, the review by Carroll (1993) of more than 70 years of intelligence testing integrated most of the prior studies such as the g f – gc model of Horn & Cattell (1966) or a hierarchical model of g with second order factors of verbal and educational (v:ed versus spatial, practical and numerical (k:m (Vernon, 1965) into a the three stratum model of g Deary et al. (2010) which, in some versions g – g f – gc is known as the Carroll-Horn Cattell (GHC) model (McGrew, 2009). An alternative three level model (VPR) pitted the v:ed and k:m model against the g f – gc and suggests the importance of Verbal, Perceptual/memory and Rotational abilities W. Johnson & Bouchard Jr. (2005) as second level strata in a three level model. (Pre- sentations with few tests tend to discuss three level models, where the lowest level is a test, but as the number of tests increases the lowest level becomes the factor representing these tests). An important concept in relating cognitive variables to criteria is the correct level of analysis (Wittmann, 1991) which helps provide an agreed upon structure to the studies of ability.

2000–2010

Revival of interest

The last fewyears have seen a revival of interest in individual differences. Not only this handbook, but also the texts by Cooper (1997), Chamorro- Premuzic (2007), and

M. W. Eysenck (1994), well as handbooks on methods (Robins et al., 2007), in- dividual differences in social (Leary & Hoyle, 2009) or cognitive (Gruzka et al., 2010) correlates and edited volumes on biological bases (Canli, 2006) and Reinforcement Sensivity theory (Corr, 2008).

The journal Personality and Individual Differences has seen its page count expand dramatically as the output of differential psychologists continues to grow. In organizational psychology, meta analyses showing the importance of cognitive (Kuncel et al., 2001, 2007) and non-cognitive predictors (Barrick & Mount, 1991; Mount et al., 2005) for real world outcomes that include occupational attainment, marital stability and early mortality (Roberts et al., 2007).

Individual Differences theories applied to psychopathology

Clinical psychology has always been concerned with individual differences, and was the motivation behind developing such tests as the MMPI (Hathaway & McKinley, 1943) and later, the Schedule for Non Adapative and Adaptive Personalilty (SNAP, Clark, 1993) but until recently that has been surprisingly little interchange between the personality and abilities communities with those who study psychopathology. It would seem that the emphasis on Neuroticism and trait anxiety of many trait theorists would have had direct applications in theories of psychopathology, but the emphasis upon diagnostic categories rather than continuous traits has led to a lack of interaction. Exceptions to this general rule include work relating personality traits to Axis I disorders (Trull & Sher, 1994; Krueger et al., 1996), the work on positive and negative affectivity in models of depression and anxiety (Clark et al., 1994; Watson et al., 2005) as well as applications of the Five Factor Model to predict personality disorders (Bagby et al., 2005; Costa & Widiger, 2002; Widiger & Costa, 1994). The taxonomic work of Krueger (2002); Krueger & Markon (2006), Markon et al. (2005) and Tackett et al. (2008) integrating the dimensions of normal personality with a dimensional rather than categorical organization of psychopathology (Watson, 2005) should lead to better theory development in both of these aspects of differential psychology.

Biological models

Reinforcement Sensitivity Theory. The rat inspired Reinforcement Sensitivity Theory (Gray, 1981, 1982; Gray & McNaughton, 2000) was developed primarily as a theory of anxiety but has had an enormous impact upon biologically inspired personality theorists in general (Corr, 2002, 2008). As Smillie et al. (in press) discuss, RST was developed from the bottom up (from the physiology of the rat up to the behavior of the human) rather than the conventional top down description and theorizing of most personality research. To some, RST is a projective test (Revelle, 2008) in that how it is interpreted depends a great deal upon the investigator. This is perhaps why there is an ongoing debate about the range of the RST (Smillie et al., 2006; Smillie, 2008, in press, and the discussions following). It seems clear that for at least the next decade it will be an active research endeavor.

Other biological models. Contemporary biological models have benefitted from technological advances in assessing neurophysiology. MRI studies have investigated structural correlates of individual differences (Omura et al., 2005; Rauch et al., 2005) from the perspective of learning theory. Depue (1995) his colleagues (Depue &

Collins, 1999) claim that individual differences in the strength of a neurobehavioral system tied to dopaminergic functioning is the causal basis for extraversion. Although research on this theory is still in its nascent stages, EEG studies generally supporting the dopaminergic hypothesis (Wacker et al., 2006). Perhaps the most important methodological advance has been the use of fMRI to study how patterns of brain activation relate to individual differences. In particular, Herrington et al. (2006) reviewed evidence suggesting that left hemisphere lateralization is associated with approach temperament. There is mixed evidence that approach temperament, consisting of extraversion, positive affect, and behavioral approach (Elliot & Thrash, 2002), predicts high performance on a variety of neuropsychological tasks that require cognitive functions that are specialized to the left prefrontal lobe. fMRI has also been used to study how individual differences correlate with specific brain regions (Canli, 2004; Canli et al., 2001). New technologies offer exciting opportunities for uncovering the biolgoical bases of individual differences; however, there is also an increased likelihood that data generated by novel approaches may be analyzed inappropriately (Vul et al., 2009). As research in this domain moves forward, it will be important to balance enthuisasm with careful analysis and interpretation.

An important biologically based variable that affects social behavior, affect, and cognition is the diurnal arousal rhythm of animals as diverse as humans, hamsters, and fruit flies. Not only do people vary in their arousal over the day, but the time of peak arousal varies systematically between individuals. Diurnal rhythms and individual differences in phase have been used for testing theories of personality. The interactive effect on cognitive performance of impulsivity, caffeine, and time of day (Revelle et al., 1980) was used to argue against the arousal theory of extraversion (H. J. Eysenck, 1967). Individual differences in diurnal rhythms as assessed by core body temperature were correlated with various measures morningness-eveningness as well as voluntary sleep and awakening times (Baehr et al., 2000). The minimum body temperature of self described morning types was roughly two hours ahead of that for self described evening types, although the behavioral response to social cues led to a smaller difference in voluntary sleeping and rising times between the two groups. The combination of body temperature rhythm and sleep and waking times suggests why evening people are more alert than morning types before going to sleep, and why the evening types are so sluggish after awakening. Individual differences in diurnal rhythms are particularly important for sleep researchers (Taillard et al., 2003), especially those interested in sleep problems associated with adolescents versus adults (Crowley et al., 2007). The combination of social cues with an endogenous clock rhythm has important implications in other species as well: for instance, in the fruit fly where mating habits of different species depend upon their arousal cycle (Rosato & Kyriacou, 2008).

Genetics

Perhaps one of the clearest findings in differential psychology in the past 30 years is that almost all differences are under moderate to strong genetic control (Bouchard, 1994, 2004; Bouchard & Loehlin, 2001; McGue & Bouchard, 1998; Pedersen et al., 1988; Spinath & Johnson, in press, this volume). Equally strong, and much more surprising, is that when doing an ACE analysis (analyzing for additive, common environmental, and unique environmental effects), there is generally little to no

evidence for shared family environments. These effects are not just for the standard measures of ability or the 'Big 5' dimensions of personality. They are true for various psychopathologies, for interests, for sexual orientation, and even for religiousity. Indeed, it is now noteworthy when an differential trait does not show a substantial genetic component.

That something is heritable does not imply a simple genetic architecture. Heritability is just a ratio of variance that can be associated with genetic causes to the total observed variance. Genetic effects can interact with (Caspi et al., 2002) and/or correlate with environmental variation in complex manners (W. Johnson, in press). One of the major disappointments of the switch from quantitative behavioral genetics to the molecular genetics and the search for particular genes is how few genes have been shown to have replicable effects, and even of those, how small the effects are. The simple One Gene-One Disease (OGOD) hypothesis (Plomin et al., 1994) derived from medical genetics, or its somewhat more complicated alternative of One Gene-One System Hypothesis (OGOSH) does not seem to be supported. Even for clearly genetic traits such as height (with a heritability greater than .8), it is hard to find any single gene that is strongly associated with height. Basic concepts to remember when reading the behavior genetic literature are that

1. Additive heritability is a hodgepodge ratio of genetic variance to total variance.
2. The less the environmental variance, the greater the heritability.
3. Heritability within groups does not imply between genetics causes of between group differences.

Between group versus within group differences. A recurring problem in inference about genetics is whether genetic variability within groups has anything to do with genetic differences between groups. Consider the example of height (W. Johnson, in press). It is well established that he heritability of height is roughly .8 within cultures. That is, that about 80% of the variability in height is associated with genes. But it is equally well established that height changes in response to nutrition. Two groups that are genetically equivalent (North and South Koreans) differ by about 6 inches in height. How can this be? The answer is that heritability estimates, based upon within group environmental variance, do not consider environmental variability between groups nor do they say anything about how the trait will respond to environmental changes that do notvary within the group.

Related to this is the so-called "Spearman Hypothesis" that if factor loadings on a variable are correlated with heritability and also correlated with between group differences, then the between group differences must be genetic. A simple thought experiment shows why this is not true. Consider variables measuring overall height. Of these, some will be better measures of height than others, perhaps because of reliability issues, perhaps because the others are less valid. In this case, the factor loadings on the general factor of height will be correlated with their heritability values. In addition those measure that are the better measure of height will show the biggest between group difference on height. Indeed, the factor loadings, heritabilities and between group differences will be highly correlated, even though the between group difference is due to nutrition.

Sex differences

Are men and women different? Yes. But how and why continues to be an important question for differential psychologists. Schmitt et al. (2008) examined sex differences on a short form of the Big 5 (BFI Benet-Mart´ınez & John, 1998) across 55 different countries. The mean z score sex differences showed that women are more neurotic ($z^- = .40$), agreeable ($z^- = .15$), conscientious ($z^- = .12$), extraverted($z^- = .10$) and less open ($z^- = -.05$). Schmitt et al. (2008) found that sex differences vary across cultures as a function of equality. That is, higher levels of health, access to education and well being were related to greater sex differences. These results differ somewhat from an international (but English speaking) web based self selected sample of more than 50,000 participants who took a Big 5 inventory and reported their SAT Verbal and SAT Quantitative scores (Revelle et al., 2010), women were more agreeable (d = .56), less emotionally stable (d = -.54), less open (d = -.30), more conscientious (d=.24) and more extraverted (d=.14). Men and women reported practically identical SAT Verbal scores, but lower SAT Quantitative scores (d=.29). Gender differences have been reported for the facets of the NEO, and to be greater in Europe and America than other cultures (Costa et al., 2001).

Although the stereotype is that women talk more than men, an observational study which sampled talking behavior for 30 seconds every 12.5 minutes for several days did not find a reliable difference in talking behavior between men and women (Mehl et al., 2007).

Even among amazingly talented women and men, there are reliable sex differences in interests and values (Ferriman et al., 2009). More importantly, these differences grow through their career. Men were more career focused and willing to take greater risks in order to receive greater recognition. Women, on the other hand, emphasized community, family and friendships. It seemed as if the men were emphasizing goals that differentiated them from others (inter-individual), while the women were emphasizing family and friends.

Although men and women do not differ in overall ability, the importance of mean differences in the lower order factors of ability tests are masked when looking at overall g scores. Women out perform men on verbal and perceptual speed tasks but do less well on visuospatial problems (W. Johnson & Bouchard Jr., 2007). These sex differences, although strong, partly depend upon method of analysis (Steinmayr et al., 2010). Sex differences in the variance of ability although small, occur early in life (Arden & Plomin, 2006) and have important implications for the frequency of men and women with extreme scores.

Integrating abilities, values, and interests

Individuals differ not only in their abilities and temperaments. They also differ in their values (Feather, 1995; Rohan, 2000) and interests (Holland, 1959, 1996). Unfortunately, although there are exceptions (Ackerman, 1997; Ackerman & Heggestad, 1997; Ferriman et al., 2009; Lubinski & Benbow, 2000), there have been few attempts to integrate the research in interests with research in ability or temperament. Promising attempts are being done as part of the longitudinal study of mathematically precocious youth (Lubinski & Benbow, 2000, 2006). Ackerman & Heggestad (1997) have proposed 'trait complexes' of mixes of abilities and interests and suggest that

> abilities, interests, and personality develop in tandem, such that ability level and personality dispositions determine the probability of success in a particular task domain, and interests determine the motivation to attempt the task. Thus, subsequent to successful attempts at task performance, interest in the task domain may increase. Conversely, unsuccessful attempts at task performance may result in a decrement in interest for that domain. (Ackerman & Heggestad, 1997, p 239)

The theory of Work Adjustment (Lofquist & Dawis, 1969) as modified by Lubinski & Benbow (2000) is an excellent example of how to blend individual differences in abilities, interests, and values into a long term theory of job satisfaction. Applications of this model to the long term career choices of especially talented men and women (Ferriman et al., 2009) show the power of the model. This work, although very important, has not yet be integrated into a general theory of individual differences.

Applications

It is important to recognize that differential psychology is not just an academic exercise in measurement and theory building. The use of ability, psychomoter and personality inventories in predicting real world criteria is an important application of our work. Reminiscent of the personality characteristics discussed in The Republic, Musson et al. (2004) wheb predicting aviator or astronaut success found that

> Superior performance has consistently been linked to a personality profile characterized by a combination of high levels of instrumentality and expressivity along with lower levels of interpersonal aggressiveness. This personality profile has sometimes been referred to as the "Right Stuff," suggesting that this is the ideal description for an effective astronaut or pilot. Inferior performance has been linked to personality profiles typified by a hostile and competitive interpersonal orientation (the "Wrong Stuff," suggesting that these individuals may not have the best characteristics for teamwork in complex settings) or to low achievement motivation combined with passive-aggressive characteristics (the "No Stuff" cluster, referring to individuals who score uniformly low on key traits). (Musson et al., 2004, p. 342)

For predicting success in graduate school, a combination of ability and conscientiousness predicts success across programs (Kuncel et al., 2001). Long term follow up studies of especially talented 12 year olds have shown the power of ability as well as interests in predicting careers in the STEM (Science, Technology, Engineering, and Mathematics) fields (Ferriman et al., 2009; Lubinski & Benbow, 2000, 2006). It is not just raw talent that is important in terms of who succeeds in a STEM career, but the relative mix of verbal, spatial, and quantitative abilities, as well as interests in family and friends (Ferriman et al., 2009).

Personality, Ability and Values across nations

People as well as nations differ in wealth, education, mental health, nutrition and values (Bardi & Schwartz, 2003; Schwartz & Bilsky, 1987). Attempts at integrating between nation and within nation individual differences are fraught with methodological complications (Hunt & Wittmann, 2008) but also suggest interesting

hypotheses about the effects of culture upon behavior (Chiao & Blizinsky, 2009). There is some work attempting to integrate values with abilities and temperament, both within and between nations (Stankov, 2009).

Current Status and Future directions

It is clear that differential psychology has a storied and illustrious past. It is also apparent from the number and diversity of areas reviewed that differential psychology currently has a firm foothold in the field of psychology and has made broad contributions to science more generally. As with any science, however, the task of theorists and researchers is not to relive the glory years or dwell on misguided ventures (i.e., the "Dark Ages"). Rather, the task is to continue to make progress and push the boundaries of knowledge by attempting to answer difficult and important questions. Differential psychology is facing such questions on all fronts and across many levels of analysis. Questions at the forefront of contemporary differential psychology range from how basic genetic and neurobiological characteristics contribute to individual differences (Canli, 2006) to questions about how high-level social and cultural systems interact to influence individual differences (Van de Vijver & Leung, 2008).

Differential psychology, at its heart, seeks to understand variation in how people feel, act, and think and want (Allport, 1937; Emmons, 1989; J. A. Johnson, 1997; Winter et al., 1998). As such, researchers studying differential psychology tend to consider questions in one of four domains of effective functioning: affect, behavior, cognition, and motivation (desire) – the "ABCDs of Personality" (Revelle, 2008). Briefly, affect comprises feelings, emotions, and moods; behavior comprises motor actions such as walking and talking as well as physiological processes such as heart rate; cognition comprises thoughts and beliefs as well as how one makes meaning from the world and out of one's life; desires comprise motivational tendencies, drives, and one's short and long-term goals. Researchers typically focus on one ABCD domain of functioning to the neglect of considering connections across levels and domains.

In the domain of affect, there has been considerable debate about over how many and which dimensions best characterize affective space, with various competing models garnering empirical support. The circumplex model of affect (Barrett & Russell, 1998; Russell, 1980) arranges affective space around the dimensions of Valence and Arousal. In this model, positive and negative emotions are considered bipolar opposites. In contrast, other two-dimensional models of affect propose that positive and negative affects reside on two independent unipolar dimensions (Cacioppo & Berntson, 1994; Thayer, 1989; Watson et al., 1988). A three-dimensionsal model has been proposed that incorporates a Valence dimension with two independent arousal dimensions, Energetic Arousal and Tense Arousal (Schimmack & Grob, 2000; Schimmack & Reisenzein, 2002). Not only do average levels of the aforementioned affective dimensions differ between people (Watson, 2000), but recent research has also shown that the structure of affective space itself may be considered an individual difference variable (Feldman, 1995; Rafaeli et al., 2007).

A longstanding goal of individual differences research is to predict behavior (Allport, 1937; Fleeson, 2001; Pervin, 1994). Indeed, predicting on-going behavior in naturally occurring environments is extolled as a gold standard in individual differences

research (Craik, 2000). With some notable exceptions including H. J. Eysenck & Himmelweit (1947)'s work on the factor structure of behavioral observations, this goal has too seldom been realized. It has historically been relatively difficult and expensive to collect large slices of naturally occurring behavior (Eaton & Funder, 2003; Funder, 2001); however, recent advances in methods of data collecting behavior including electronic diaries (Green et al., 2006), portable recorders (Mehl & Pennebaker, 2003), and cell-phone methods of data collection (Collins et al., 2003; Reid et al., 2008) have made it easier to obtain data on behavior as it occurs. Such advances combined with instruments tailored to assess behavior (Funder et al., 2000) have resulted in a growth of studies looking at how Big-Five trait dispositions are reflected in behavior across time (Fleeson & Gallagher, 2009; Mehl et al., 2006; Paunonen, 2003).

The research on intelligence constitutes the most influential and well-established study of any cognitive individual difference variable. Real world criteria range from job performance to mortality (Deary et al., 2004, 2010). Researchers have begun studying how personality dispositions relate to cognitive differences, with most of this research focusing on the trait of openness/intellect (Costa & McCrae, 1992b; Hofstee et al., 1992b). Individuals higher in openness generally score higher on measures of cognitive ability (DeYoung et al., 2005; Revelle et al., 2010), are seen as displaying more creative thinking and have a greater capacity for divergent thinking (McCrae, 1987). Developing in parallel to research on trait dispositions is the social- cognitive approach to personality (Bandura & Press, 1999; Dweck & Leggett, 1988). Researchers in the social-cognitive tradition emphasize variations in cognitive tasks, strategies, and schemas. Some of the most well-know research from this approach has examined differences between people who perceive ability as stable, labeled entity theorists, and those who see ability as malleable, labeled as incremental theorists (Hong et al., 1999). Cognition also includes the life-narrative approach to individual differences (McAdams, 2008), which focuses on variations in how people integrate their remembered past, experienced present, and imagined future into a coherent life story.

Research on individual differences in motivation or desire has made some impressive findings in recent years. A hierarchical model of independent approach and avoidance motivation dimensions has been specified (Elliot & Church, 1997), elaborated (Elliot & McGregor, 2001), and correlated with individual differences in academic performance (Cury et al., 2006). Higgins (1998)'s Regulatory Focus Theory (RFT), which posits that people are guided by two distinct motivational systems: promotion focus and prevention focus, has gained solid footing in the literature on motivation. Promotion focus is manifested in attempts to bring one's actual self into alignment with one's ideal selves reflecting one's wishes and aspirations. Prevention focus leads one to bring one's actual selves into alignment with one's ought selves or the standards reflecting duties and obligations. Research on broad life goals, which had long been neglected, has recently picked up in the context of relating goals to Big 5 variables (Roberts & Robins, 2000; Roberts et al., 2004). In addition to nomothetic approaches to motivations and goals, idiographic assessments of what people strive for in their lives (Emmons, 1986) as well as their personal projects (Little et al., 1992) have also gained popularity.

The fact that domains of functioning are studied in isolation from each other level is not a criticism of those researchers for indeed each level and domain deserves careful attention. However, failure to pursue integration may leave gaps or holes (Rozin, 2007) in theories of individual differences. Therefore, the state of research on individual differences is in need of frameworks in which integration across levels may be achieved. The question of integration boils down to a question of organization. That is, how can theories of individual differences be organized such that the domains of functioning (ABCDs) may be connected in meaningful ways to each other?

We believe that such an integration may be forged by adopting an information processing perspective. Specifically, individual differences in the coherent patterning of affect, behavior, cognition, and desire may be understood at three levels of information processing - reactive, routine, and reflective (Ortony et al., 2005). It is important to note that the reactive, routine, and reflective levels are not separated by sharp boundaries but lie on a continuum of complexity ranging from more basic and immediate processes (reactive) to well-learned and rehearsed processes (routine) to complex and abstract processes (reflective).

The reactive level of information processing comprises rapid and efficient responses to stimuli. Responses at this level consist of a unified combination of affective and behavioral and motivational processes. For example, after touching a stove burner, the motivation to avoid pain, (Desire), fear (Affect), and removal of one's hand (Behavior) likely occur simultaneously and do not require elaborated cognition. The routine level comprises well-learned, everyday activities. At this level, affect, behavior, and motivation may be distinguished from each other due to the emergence of low-level cognitive processes. At the routine level of processing, an individual noticing his or her hand approaching a hot stove would be able to cognitively discriminate between the present state of not being in pain and fear (Affect) an uwanted future state of pain (Desire). The individual may thus act (Behavior) to increase the likelihood that pain does not ensue. The reflective level describes higher-level cognitive functioning such as self-awareness and metaprocessing. At this level affect becomes enriched with cognitive content such that conscious plans may guide behavior toward or away from well-elaborated and nuanced goals. One may safeguard the stove so that young children are unlikely to come into contact with the burners.

The above examples lead to the realization that the ABCDs constantly interact in dynamic ways across multiple levels of information processing. As such, those dynamic interactions should be a focal point of differential psychology theories and failure to consider such dynamics may limit the generation of comprehensive theories of individual differences. By adopting an information-processing approach, the study of differential psychology becomes the study of the coherent patterning of ABCDs across time and space (Wilt & Revelle, 2009). The task of differential psychology thus becomes the task of explaining why people have different ABCD patterns across the different levels of information processing and determining how those differences relate to important outcomes.

The ABCD approach has the potential to serve as an overarching conceptual framework for individual differences research. It is important for future research not only to integrate across levels of analysis and domains of functioning but also to

resolve some of the specific and pressing issues facing differential psychology today. As would be expected of such a broad and fast-expanding field, questions facing differential psychology involve tackling the influence of variables from genes to virtual environments, and many questions revolve around the use of new technologies.

Although it is too early to render judgment on the usefulness of genome wide association studies (GWAS), the high cost and limited benefits of current GWAS of disease (Kraft & Hunter, 2009) raise the question of whether individual differences research would benefit from employing such methods. Some great discoveries have been made (Amos, 2007), but the infrequency with which these findings occur suggests that the traditional GWAS method of exploring common gene variants is in need of some rethinking before it is adopted by differential psychology. Remaining in the realm of biology, serious thought should also be given to the use and interpretation of fMRI data given the recent debate about whether current findings using fMRI inflate relationships between brain and personality processes (Vul et al., 2009).

Developmental research on individual differences must go beyond studying genes and neurophysiological processes in isolation to focus on interactions between biological and environmental variables using longitudinal studies. When such interactions are found they generate a tremendous amount of excitement (Caspi et al., 2003); however, interactions are difficult to replicate (Os & Rutten, 2009), calling into question their validity. Further attention may be warranted due to the importance of interactions in establishing boundary conditions for theories of the etiology of disorders as well as for identifying particular populations that might be at most risk for developing disorders.

Longitudinal studies have been instrumental in showing how differences in the Big-Five traits relate to myriad important outcomes such as mental health, mental disorders, job success, marriage satisfaction, and even mortality (Ozer & Benet-Martinez, 2006; Roberts et al., 2007). Indeed, trait psychology has been one of the most successful enterprises of personality for predicting and understanding healthy psychological functioning. Future research should focus on the mechanisms through which traits achieve their effects. Finding mechanistic relationships may be instrumental in developing effective interventions. Research predicting practical outcomes from traits should be balanced with basic research aimed at uncovering the etiology of individual difference dimensions. Non-intuitive but exciting ways to study basic individual differences in humans that do not rely even human beings may be explored by studying animal personality (Vazire & Gosling, 2003; Vazire et al., 2007). There has been a long history of studying biological mechanisms thought to relate to personality using animal models in drug or lesion studies (Gray, 1982; Gray & McNaughton, 2000) as well as selective breeding studies (Broadhurst, 1975). But now, observational studies of non-human animals may allow individual differences researchers opportunities to examine questions that are difficult or impossible to explore in humans.

The already vast database on individual differences is sure to continue grow at an increasingly fast rate given the ease of public domain personality assessment, specifically using resources suc as the IPIP (Goldberg, 1999; Goldberg et al., 2006). The possibility for such data to be stored in large databases available for public use

heeds the call to make differential psychology accessible to everyone. Additionally, the ability to make inferences about individual differences based on the content of personal websites (Gosling et al., 2004) should only augment the richness of individual differences data that are readily available.

Conclusion

In what ways do people differ from each other? Why do people differ from each other? To study individual differences is to ask these fundamental questions. Although the scope and importance of these questions is almost impossible to overestimate, the field of differential psychology must not be content to tackle description and theory-building alone. In order for the field to realize its potential, it must also be concerned with using individual differences to predict important outcomes. What characteristics make someone a successful graduate student, military officer, or business executive? Generating knowledge about how and why people differ and applying that knowledge to potentially improve society are the daunting tasks charged to our field, but we are well-prepared. Differential psychologists are making advances in understanding characteristic patterns of affect, behavior, cognition, and motivation; these patterns may be conceptualized as individual differences in abilities, interests, and temperament. There may be relatively weak correlations across AIT domains, but it is important that differential psychologist not get discouraged over these results. Indeed, loose associations among these constructs are encouraging because that means that variables from each domain may serve as important predictors in their own right. Thus, abilities, interests, and temperaments may have additive and interactive relationships to practically important outcomes. The focus of the field may thus benefit from shifting its focus from correlational structure to prediction. By doing so, we may achieve another high point similar to that we realized in the mid-20th century. Indeed, the future of differential psychology is more promising than it has been for decades.

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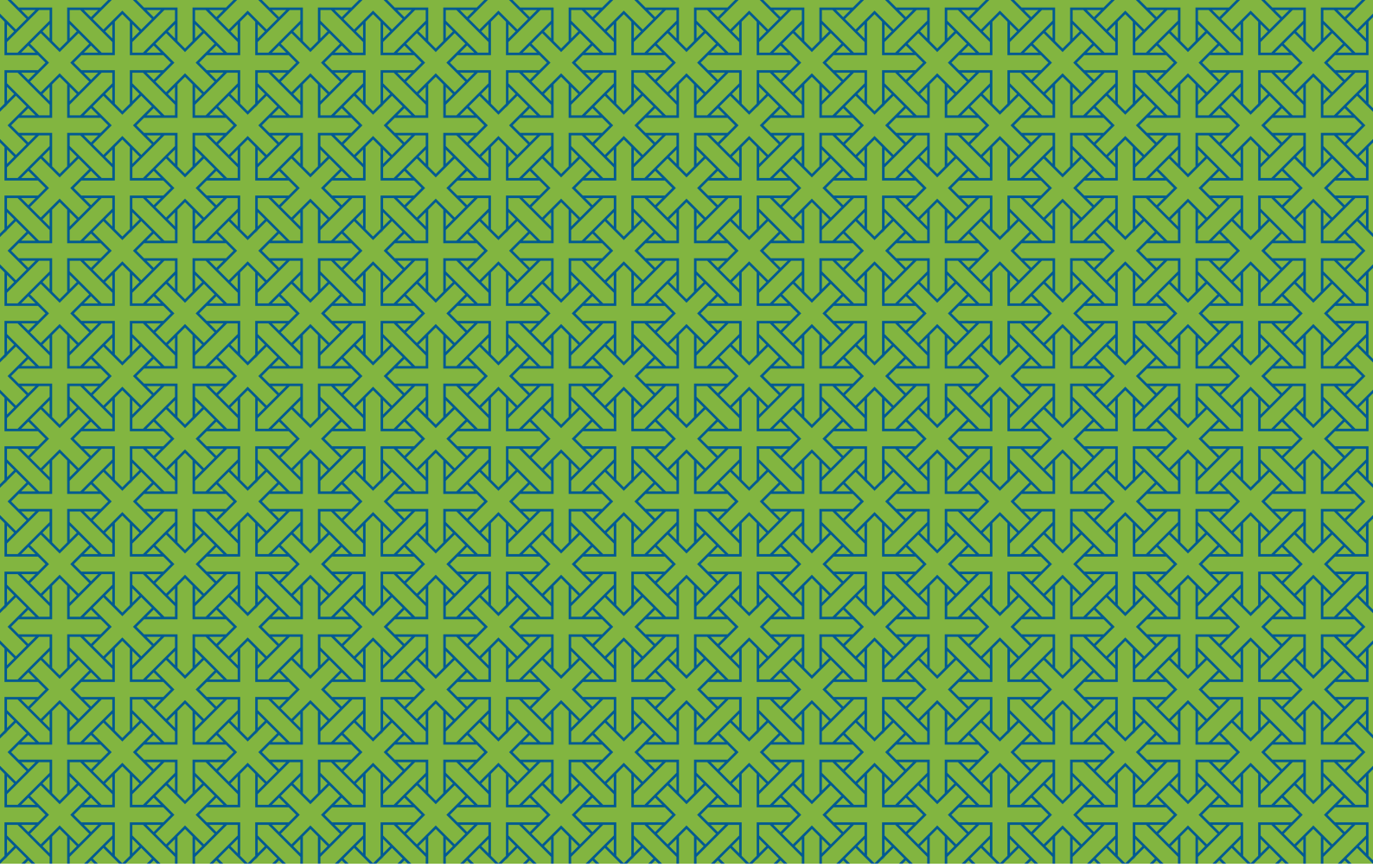

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