

Introduction Stanovich, Chapter 1

I. INTRODUCTION

A. Exercises

- 1. Write a brief characterization of each of the following professionals:
 - A. Psychologist
 - B. Astrologist
 - C. Scientist
- 2. List the most interesting psychologist or idea in psychology in the last 25 years. Think of ideas in classes you found exciting or surprising, or important.

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B. Diversity of Psychology

- What do you think it means that we can not agree about what is interesting, exciting or important?
 - Does it mean that psychology is in trouble because of the diversity of ideas?
 - Guess how many divisions that there are in APA? ([Divisions](#))
 - Guess how many journals APA publishes? ([APA Journals](#))
- Do psychologists hold anything in common?

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C. Unity of Psychology

- Science is the tie that binds all psychologists:
 - The application of science to answer questions about the mind and behavior and to improve of the human condition.
 - There are other *non-scientific* approaches to the study mind and behavior
 - Definitions of Astrology include the prediction and explanation of behavior.
 - Other sciences do not address mind and behavior or seek to improve the human condition.
 - Descriptions of scientists were as *physical* scientists
 - Psychologists = Scientists > Astrologists

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D. What is Science?

- So what are the essential characteristics of science?
 - Science is a way of thinking about and observing the universe that leads to a deeper understanding of its workings (Stanovich, p. 8).
- Stanovich discusses three characteristics of science.
 - Systematic empiricism
 - Publicly verifiable knowledge
 - Address solvable problems

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D. What is Science?

- **1. Systematic Empiricism**
 - Empiricism refers to finding evidence in the world
 - Science involves answering questions empirically, by “taking a look”!
 - Systematic Empiricism means that there are better and worse ways to “take a look”.
 - Not all evidence is created equal.
 - Evidence is stronger when it is collected in a systematic way and weaker when it is collected in an unsystematic way.
 - But as everything else in Psychology, things get complicated in the details, which we will consider.
 - We will review the ways to “take a look” in Chapters 4, 5, and 6 in Stanovich.

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D. What is Science?

- **2. Publicly verifiable knowledge.**
 - Knowledge created in science is social knowledge in three ways:
 - **Open to scrutiny.** Scrutinizing one’s own or others’ knowledge claims is a critical component
 - **Replication:** Try the same conditions as someone else and see if you see the same things,
 - **Peer Review:** All interpretations are open to review.
 - We will consider the importance of publicly verifiable knowledge in science in Chapter 3 in Stanovich when we consider “Operationalism”.

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D. What is Science?

- **3. Addresses solvable problems**
 - Questions that can’t be answered by using the scientific method are rejected as unscientific.
 - Science can deal only with ideas that can be tested. But what is “scientific” changes, as new technologies are used to measure phenomena and test ideas.
 - PET and fMRI techniques in brain research has lead to theories of the neurological basis of consciousness.
 - We will consider the concept of solvable problems in Chap. 2 in Stanovich
 - It will come up in Chaps. 8 and 9 when we consider how scientific ideas change in psychology.

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D. What is Science?

- There are no agreed upon one best procedure in scientific psychology.
- However, a central role is played by probability and statistics in psychological research.
 - Many who criticize psychology do not think probabilistically and so do not understand research in the discipline.
 - Similarly rather than relying on statistical information to make decisions, people appear to prefer to make decisions on intuitive and personal information
- We will consider the role of probability and statistics in psychology in Stanovich's chapters 10 and 11.

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E. Metaphors of science

- There are two metaphors for science
- 1. Science is like a game of **20 Questions**
 - I have something in this bag: Try to guess what it is by asking me only yes or no questions.
 - Is this a good metaphor of science?
 - It looks like science because you formulate ideas or hypotheses, test them out by asking questions, and then revise them when you get an answer.
 - This is just like the "scientific method" you learned about since elementary school.

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E. Metaphors of science

- But the metaphor breaks down:
 - Reality is never so honest about telling when you are on the wrong track.
 - Wrong explanations are held on to for years before being rejected.
 - Reality is never so direct about giving you answers to your questions.
 - Two competent researchers can disagree about evidential support for a theory
 - Reality is never so specific about whether or not you are right or wrong.
 - No theory is ever completely confirmed by evidence.

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E. Metaphors of science

- **2. Producing and understanding variation**
 - This is what was in the bag. Try to figure out what it is. What do you do?
 - Cause the object to behave in different ways .
 - This is like science because you produce variation in an object and try to understand the changes you produce.
 - Variation is another way of saying change or difference.
 - From all that variation information you can understand what the object does.

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E. Metaphors of science

- “Production and understanding variation” is a better metaphor of science than “20 questions”
- In this case, reality is assumed not to give **direct**, **honest**, or **specific** answers to questions.
 - Researchers produce or observe variation in order to understand the causes of or conditions associated with the variability.
 - The creativity of the researcher in producing or observing variation is the basis for how well understood the phenomenon is.
- Good research involves producing, observing, and understanding variation in phenomena.

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E. Metaphors of science

- To study aggression in children, researchers ask questions about variation, such as:
 - Do children who watch a lot of violent TV shows behave more aggressively than children who watch few violent TV shows?
 - Do children who had poor early environments behave more aggressively than children who had good early environments?
 - Do children who behave more aggressively have different in hormone levels than children who behave less aggressively?
- In each case, variation in aggression is related to variation in another feature (TV, poverty, biology).

II. THE CLASS

A. Outline

- We will learn about this method of producing and understanding variation.
 - Read Stanovich’s very entertaining account of how psychologists produce and understand variation.
 - Read Borden’s and Abbott’s process account of how to produce and understand variation.
 - Produce and understand variation in our own study
 - We will examine conditions related to variation in student’s algebraic thinking skills. That is, are there conditions that we can vary to get students to think like mathematicians about critical algebraic concepts.

1. Society for General Psychology	27. Society for Community Research and Action
2. Society for the Teaching of Psychology	28. Psychopharmacology and Substance Abuse
3. Experimental Psychology	29. Psychotherapy
4. There is no Division 4 [more info]	30. Society of Psychological Hypnosis
5. Evaluation, Measurement, and Statistics	31. State Psychological Association Affairs
6. Behavioral Neuroscience and Comparative Psychology	32. Humanistic Psychology
7. Developmental Psychology	33. Mental Retardation and Developmental Disabilities
8. Society for Personality and Social Psychology	34. Population and Environmental Psychology
9. Society for the Psychological Study of Social Issues (SPSSI)	35. Society for the Psychology of Women
10. Society for the Psychology of Aesthetics, Creativity and the Arts	36. Psychology of Religion
11. There is no Division 11 [more info]	37. Child, Youth, and Family Services
12. Society of Clinical Psychology	38. Health Psychology
13. Society of Consulting Psychology	39. Psychoanalysis
14. Society for Industrial and Organizational Psychology	40. Clinical Neuropsychology
15. Educational Psychology	41. American Psychology-Law Society
16. School Psychology	42. Psychologists in Independent Practice
17. Society of Counseling Psychology	43. Family Psychology
18. Psychologists in Public Service	44. Society for the Psychological Study of Lesbian, Gay, and Bisexual Issues
19. Military Psychology	45. Society for the Psychological Study of Ethnic Minority Issues
20. Adult Development and Aging	46. Media Psychology
21. Applied Experimental and Engineering Psychology	47. Exercise and Sport Psychology
22. Rehabilitation Psychology	48. Society for the Study of Peace, Conflict, and Violence
23. Society for Consumer Psychology	49. Group Psychology and Group Psychotherapy
24. Theoretical and Philosophical Psychology	50. Addictions
25. Behavior Analysis	51. Society for the Psychological Study of Men and Masculinity
26. History of Psychology	52. International Psychology
	53. Society of Clinical Child and Adolescent Psychology
	54. Society of Pediatric Psychology

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<p>General Topics</p> <ul style="list-style-type: none"> American Psychologist APA Monitor Contemporary Psychology Dreaming European Psychologist History of Psychology Journal of Psychotherapy Integration Psychological Assessment Psychological Bulletin Psychological Methods Psychological Review Psychology, Public Policy, and Law Review of General Psychology <p>Basic Research</p> <ul style="list-style-type: none"> Behavioral Neuroscience Emotion Journal of Abnormal Psychology Journal of Comparative Psychology Journal of Experimental Psychology: <ul style="list-style-type: none"> Animal Behavior Processes Applied General Human Perception and Performance Learning, Memory, and Cognition Psychological Methods 	<p>Applied & Practice</p> <ul style="list-style-type: none"> Clinician's Research Digest Consulting Psychology Journal: Practice & Research Dreaming Experimental and Clinical Psychopharmacology Group Dynamics: Theory, Research, and Practice Health Psychology International Journal of Stress Management Journal of Applied Psychology Journal of Consulting and Clinical Psychology Journal of Counseling Psychology Journal of Educational Psychology Journal of Experimental Psychology: Applied Journal of Occupational Health Psychology Neuropsychology Professional Psychology: Research and Practice Psychoanalytic Psychology Psychological Assessment Psychological Services Psychology of Men and Masculinity Psychotherapy: Theory/Research/Practice/Rehabilitation Psychology Prevention & Treatment
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<p>Social/Personality, Development Education</p> <ul style="list-style-type: none"> American Journal of Orthopsychiatry Cultural Diversity & Ethnic Minority Psychology Developmental Psychology Emotion Health Psychology Journal of Educational Psychology Journal of Family Psychology Journal of Personality & Social Psychology Psychology and Aging Psychology of Men and Masculinity <p>Professional Issues, Public Policy</p> <ul style="list-style-type: none"> American Journal of Orthopsychiatry Consulting Psychology Journal Int. Journal of Stress Management Journal of Counseling Psychology Journal of Consulting & Clinical Psych Professional Psych: Research & Practice Psychological Assessment Psychological Services Psychology, Public Policy, and Law Prevention & Treatment 	<p>Theory, Reviews, Methodology</p> <ul style="list-style-type: none"> American Psychologist Contemporary Psychology Dreaming Journal of Psychotherapy Integration Psychological Assessment Psychological Methods Psychological Review Psychotherapy: Theory/Research/Practice/
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