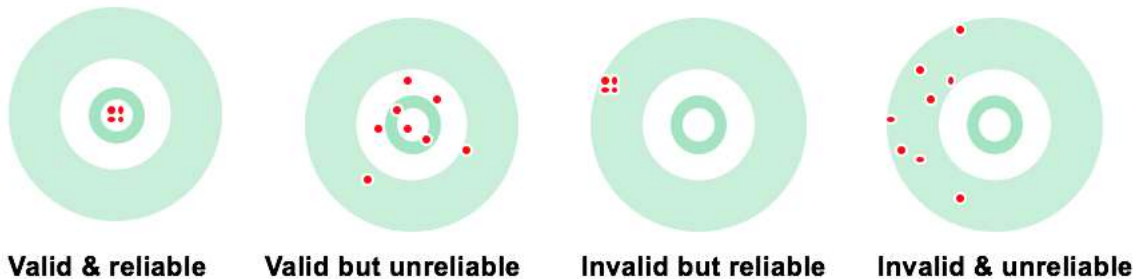


L8 – Putting it all together (measuring personality & intelligence in science)

Reliability vs Validity

- de Vaus (2002): A valid measure always hits the target assessed construct); a reliable measure always hits the same place on the target

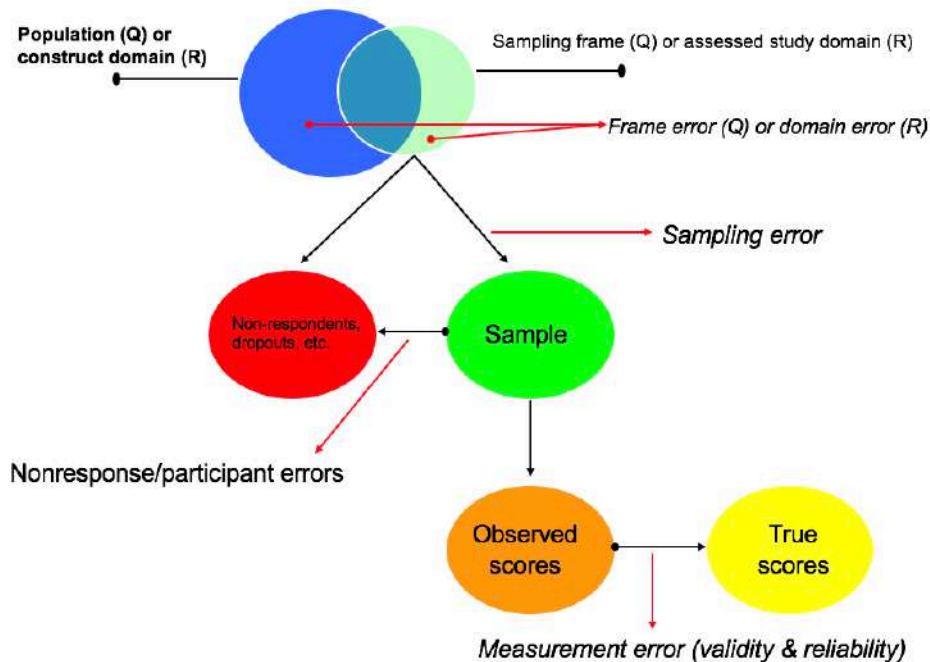
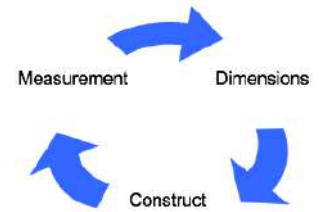


- Reliability is a necessary but not sufficient condition for validity
- At the conceptual level, a valid measure is always reliable
- In practice, the distinction between reliability and validity is rather fuzzy:
 - Cronbach's alphas can be an index of internal consistency reliability or internal consistency validity (related to construct validity)
 - By assessing parallel-forms reliability we are also assessing concurrent validity (criterion-related validity) and to a degree convergence validity
 - Assessment of inter-rater reliability is closely related to content validity
 - Finally, test-retest reliability can be used as an index of external validity

Maximising psychometric values

- Increase sample size
 - SEM is inversely proportionate to the square root of sample size
- Allow for sufficient (item/participant) meaningful variability
 - Q (respondent-centred) vs R (stimulus-centred) analysis
 - Non-discriminating items/responses – Discriminability (invariable responses, item difficulty or clarity, ceiling/floor effect)
 - Minimisation of serial effects
 - Participant-wise invariable, random, acquiescent responses
 - Homogenous and inversely keyed items tend to increase reliability
 - E.g. "I tend to be sociable" vs "I tend to be solitary"
- Conceptually & empirically valid dimensionality
 - Should make psychological sense
- Develop a "sane" research design/methodology
 - Data analysis cannot (always) account for (fix) design errors
 - E.g. constant measurements cannot (really) be statistically analysed

- A constant process:
 - Constructs (re)defined (Theoretical/Operational (re)assessment)
 - Measurements created & refined (empirical standardization)
 - Latent structure (dimensions) expanded/clarified



Beyond CTT

- Generalisability Theory (Cronbach et al., 1972)
 - Focus on how well and under what conditions can test (observed) scores be generalised
 - Attempts to understand the variability components of the scores and predict the scores' values under various circumstances
 - It adds systematic error in the observed scores and attempts to map it and eliminate (control) it
- Item Response Theory (IRT)
 - Mathematically maps the characteristics of measurement items (e.g. difficulty, discrimination), and models them against participants' ability (latent attribute) on a study construct
 - Can be used to "accurately" predict response-patterns in a given measurement, and thus evaluate and refine the psychometric properties of that instrument

Measurement standardisation & normative scores

- The process of psychometric evaluation can (should) lead to measurement (and by extension construct) standardisation
 - It is assumed that standardised measurements have identified the values of the true scores (\pm SEM) in a given population or setting (see also Confidence Intervals)

- Standard or normative scores are universally understood units in tests (e.g. percentiles) that allow for the relative evaluation (profiling) of a person's performance/attributed on a given construct

Profiling and Psychography (summing up the whole person)

- Criminal personality profiling
 - “The crime scene is, in essence, a personality projection” (Turco, 1990)
 - Eliminating suspects
 - Used with unusual crimes
 - Adaptive interrogation techniques
 - Identify unknown offenders
- Psychography, psychobiography, & psychohistory
 - Identify and explain issues and themes throughout a person's life from a psychological perspective
- Freud (1910) laid the foundations through his “proscriptive guidelines” that allow for the assessment of validity and reliability elements in personology
- Erik Erikson greatly contributed to psychography through his triple bookkeeping approach (Body-Ego-Family/Culture)

❖ Main Reading:

- Ch. 6, p. 79-83

Some psychographical/profiling articles (not needed for the course):

- Capps, D. (2004). A psychobiography of Jesus. In E.H., Harold & W.G., Rollins (Eds), *Psychology & the Bible: A new way to read the scriptures* (Vol. 4, *From Jesus to Christ*, pp. 59-70). Westport, CT: Praeger Publishers.
- Cribb, C. & Gregory, A.H. (1999). Stereotypes and personalities of musicians. *Journal of Psychology*, 133, 104-114.
- Grivet-Shillito, M.L. (1999). Carl Gustav before he became Jung. *Journal of Analytical Psychology*, 44, 87-100.
- Kaufman, J. (2001). The Sylvia Plath effect: Mental illness in eminent creative writers. *Journal of Creative Behavior*, 35, 37-50.
- McDermott, J. (2001). Emily Dickinson revisited: A study of periodicity in her work. *American Journal of Psychiatry*, 158, 686-690.
- Preti, A., De Biasi, F., & Miotto, P. (2001). Musical creativity and suicide. *Psychological Reports*, 89, 719-727.
- Runyan, W.M. (1981). Why did Van Gogh cut off his ear? The problem of alternative explanations in psychobiography. *Journal of Personality & Social Psychology*, 40, 1070-1077.
- Therivel, W.A. (1999). Why Mozart and not Salieri. *Creativity Research Journal*, 12, 67-76.
- Young, M.S., & Pinsky, D. (2006). Narcissism and celebrity. *Journal of Research in Personality*, 40, 463-471.

L15 – Albert Bandura: Social Cognitive Theory I

Outline

1. Introduction
 - Bandura's (1925 -) theory is one of the most widely accepted
 - Bandura integrated and clarified concepts from previous psychological forces
 - Personality is moulded by an interaction of behaviour, personal factors (especially cognition), and the environment.
2. Assumptions of Social Cognitive Theory
 - Direct and vicarious learning
 - People not only think, but are capable of thinking about thinking (metacognition)
 - Reciprocal Determinism
 - Bandura put 'cognition' and the 'person' back into personality
3. Observational learning
 - The core of observational learning is modelling
 - Factors that determine whether we will learn from a model
4. Bandura's four-step model of observational learning
 - Attend
 - Remember
 - Reproduce
 - Motivation because of reinforcement
5. Related Research:
 - Aggression is socially learnt (Bandura, Ross, & Ross, 1963; Paik & Comstock, 1994)
 - Higher order forms such as moral judgements are socially learnt (Bandura and McDonald, 1963; Bandura, 1991; Cowan. Langer, Heavenrich & Nathanson, 1969)

Bandura (1925 -) & the advantage of hindsight

- Integrate and clarify concepts from previous psychological forces
- Freud's description of the identification process and the importance of parental authority was made testable
- Bandura argued that the effects of contingent rewards and punishments are cognitively mediated, and is thus more readily acceptable as a theory of personality.



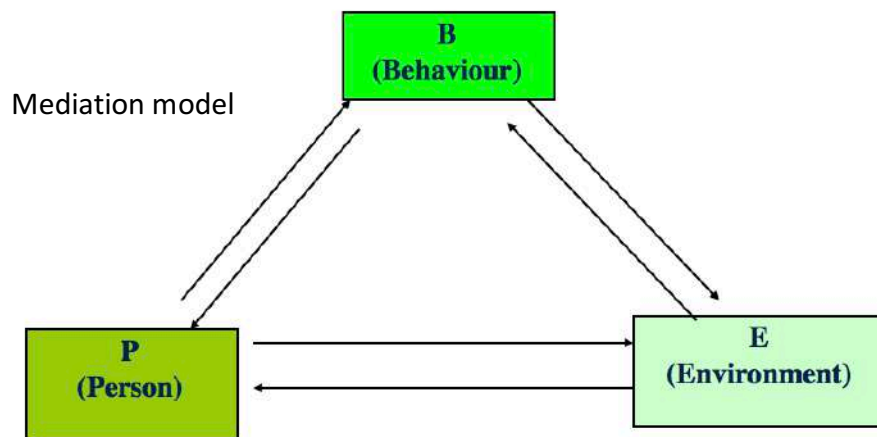
Differences between radical behaviourism and the Social Cognitive approach

Skinner	Bandura
Environment is most important	Interaction between behaviour, cognition and the environment; with cognition being more important
Responses have to occur in order to be learned	Responses can be learned by observing (cognition) another person's responses, thus learning can occur prior to our responses
Reinforcement must be directly related to your behaviour	Reinforcement can be vicarious (indirect)
Learning does not occur without reinforcement	Reinforcement does not occur without prior cognition learning is cognitively mediated and not an inevitable consequence of the environment alone
No concept of self	A self system that acts upon the environment and behaviour (self-monitoring, self-efficacy etc)

Assumptions of Bandura's Social Cognitive Theory

1. Vicarious learning
 - We can and do learn things through direct experience, but much of our behaviour is shaped through the observation of others. Bandura (1986, p. 19) stated that "virtually all learning phenomena, resulting from direct experience, can occur vicariously by observing other's behaviour and its consequences for them".
2. The importance of cognition
 - "People form beliefs about what they can do, they anticipate the likely consequences of prospective actions, they set goals for themselves, and they otherwise plan courses of action that are likely to produce desired outcomes" (Bandura, 1991, p. 248).
3. Reciprocal determinism
 - Here behaviour (and/or personality) is moulded by the reciprocal interaction of personal factors (especially cognition), environmental events and our behaviour. The person is seen as a whole entity for whom previous learning history, expectations of mastery (efficacy), and current interpretations of the world all interact to regulate behaviour.

Bandura's (1994) concept of reciprocal determinism

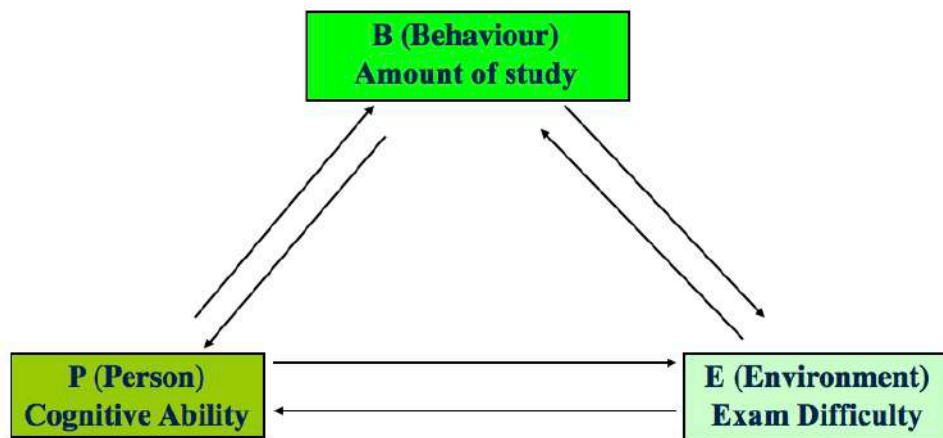


Reciprocal determinism is triatic. Personal function arises from mutual interaction between three interlocking factors:

1. Person (P): The cognitive and emotion/affective system
2. Behaviour (B): The individual's behaviour
3. Environment (E): Physical and personal environment

Each of these factors causally influences the other, with different influences occurring in different context

Bandura's (1994) concept of reciprocal determinism: Applied example



The strength of these factors need not be all equal/all make an equal contribution

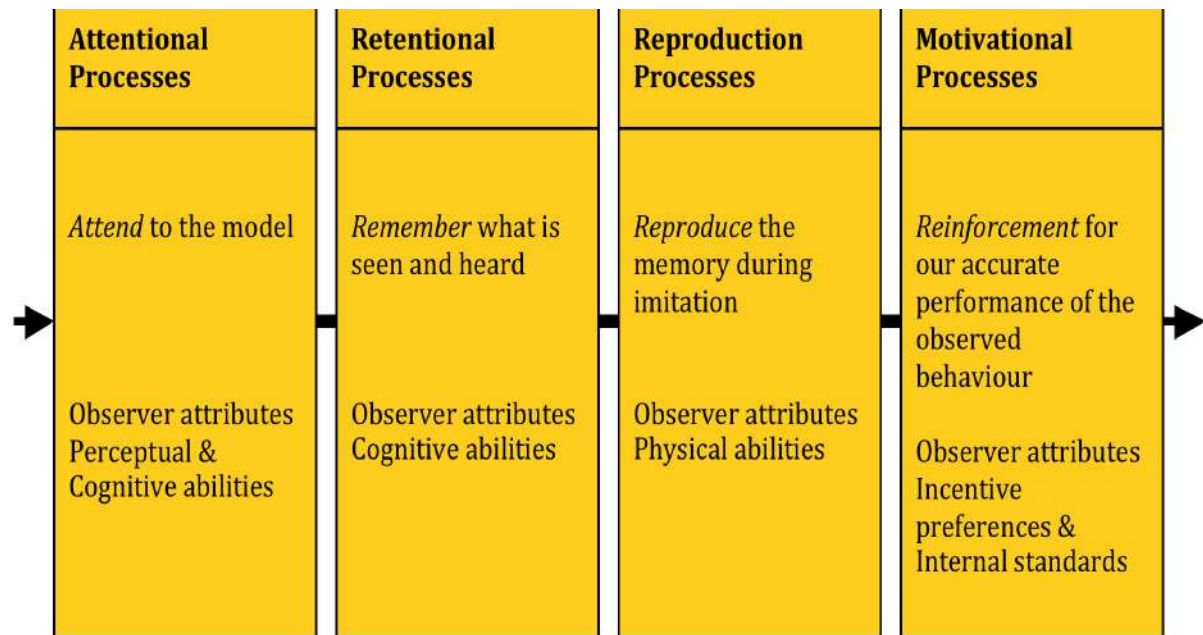
The awareness of the B-E relationship also influences the complexity of your personality

Factors that determine whether we will learn from a model

1. The characteristics of the model: we are most likely to model high status individuals, competent individuals, and powerful people
2. The characteristics of the observer: people who lack status, skill or power are most likely to model, i.e., children and novices
3. Consequences of behaviour: the greater the value that the observer places on the behaviour, the more likely that the behaviour will be learned

Bandura's four-step model of observational learning

1. Attend to the model
2. Remember what is seen and heard
3. Reproduce the memory during imitation
4. Motivation because of Reinforcement of accurate performance of the observed behaviour
5. To demonstrate that observational learning has occurred, the imitated action must consist of a newly organised pattern of behavioural responses not previously in the observer's repertoire.

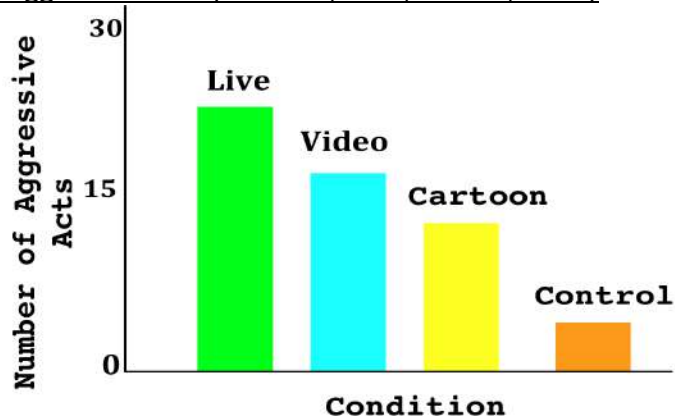


Related Research: Aggression is socially learnt



- Bandura, Ross and Ross (1961;1963) tested this idea amongst 4-5 year olds who watched a male and female adult (model) play with a popular inflated Bob doll. There were four conditions: live; videotape; cartoon; control.

Number of aggressive acts (Bandura, Ross, & Ross, 1963)



- Paik and Comstock (1994) conducted a meta-analysis on over 200 studies completed during 1957 and 1990. They found that 10 viewers out 100 would be affected by the violence they see on TV or film.



Related research: Higher order forms (moral judgement) are socially learnt

- Bandura and Mc Donald (1969) found amongst 5-to-11-year children at high and low levels of moral judgment exposed to adult models showed a substantial change in their moral judgement level. This change in moral judgement persisted (2 weeks later) when the adult model was no longer present.
- One of the most cogent arguments against social learning as the prime variable in the learning of moral judgements is the fact that lower levels of moral judgements predominate at earlier ages.



❖ Further readings:

- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1999). Social cognitive theory of personality. In D. Cervone & Y. Shoda (Eds.), *The coherence of personality: Social-cognitive bases of consistency, variability, and organization* (pp.185-241). New York: Guilford Press.
- Caprara, G. V., & Cervone, D. (2000). *Personality: Determinants, dynamics and potentials*. USA: Cambridge University Press.

L35 – Age Differences in Intelligence

Outline

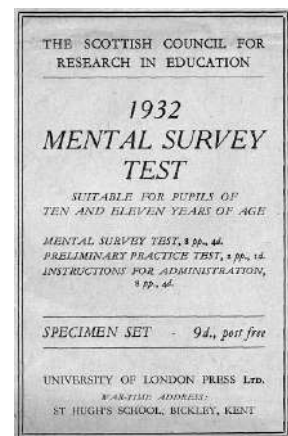
- The Scottish Mental Surveys
- Stability vs Change
- Longitudinal vs cross-sectional methods
 - Evidence from cross-sectional studies
 - Evidence from longitudinal Studies
- Domain specific knowledge and expertise

Learning Outcome

- Be familiar with some of the key large databases used in lifespan research
- Ability to evaluate the strengths and weaknesses of cross-sectional vs longitudinal research
- Know how group factors/aspects of intelligence progress across the lifespan

Studying Intelligence Over Time: The Scottish Mental Surveys (SMS)

- SMS 1932:
 - ALL 87,498 children born 1921 take *Moray house test*
 - + 1000 followed up with SB; followed into adulthood
- SMS 1947
 - ALL 70,805 children born in 1936 tested
 - + 36-day sample (social/demographic info)
 - + 6-day sample (SB2, followed for 16 years)
- Later follow-ups:
 - Aberdeen Birth Cohort 1921 (from 1997)
 - Lothian Birth Cohort 1921 (from 1999)
 - Aberdeen Birth Cohort 1936
 - Lothian Birth Cohort 1936



Moray House Test #12

Example items:

12. Fin is to fish as wing is to:

- a. Feather
- b. Air
- c. Bird
- d. Sail
- e. Herring

36. “**Tragu**” is cheaper than “**vashol**,” and “**vashol**” is dearer than “**spongop**.” Which is the dearest?

42. Underline the “different” word in:
eye, pen, nose, chin, ear

- Original purpose: selection into high school (1925)
 - ~ 45 mins long
 - 71 items
 - max score = 76

Godfrey Thomson

Developer of the Moray House Tests



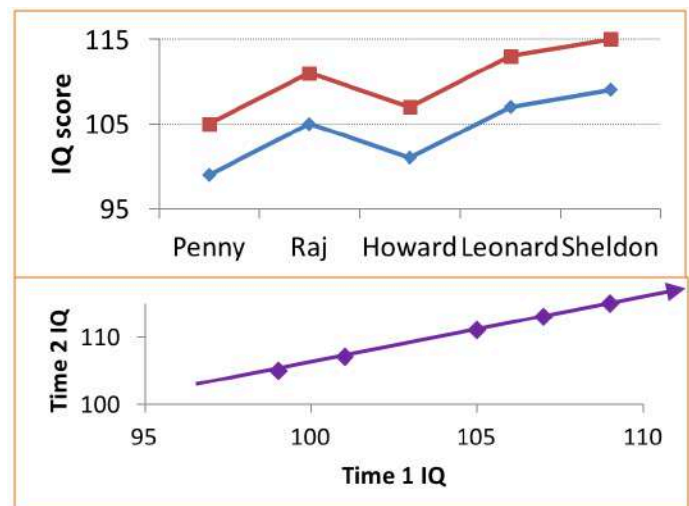
Does Intelligence Change Over Time?

“Stability” vs “Change”

- Stability = The *rank-order of people* stays the same
 - EMPIRICAL TEST: Correlations b/w intelligence at time 1 versus time 2
 - THEORETICAL MEANING: Intelligence is stable over time
- Change = The *absolute level of a trait* differs
 - EMPIRICAL TEST: Changes to intelligence *means* at time 2 compared to time 1
 - THEORETICAL MEANING: Intelligence changes/develops/declines over time
- NOTE: Test scores may remain consistent (i.e., rank-order is the same) even as levels may change (i.e., scores for the whole group increase or decrease over time)

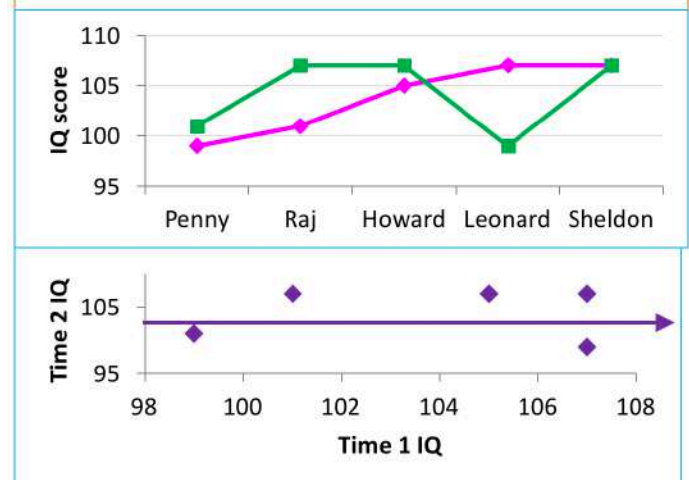
Example 1: Stable with change

- 5 people take an IQ test
- They take it 20 years later
- IQ changes for everyone
 - Mean (T1) = 104
 - Mean (T2) = 110
- IQ is perfectly stable
 - $r = 1.00$

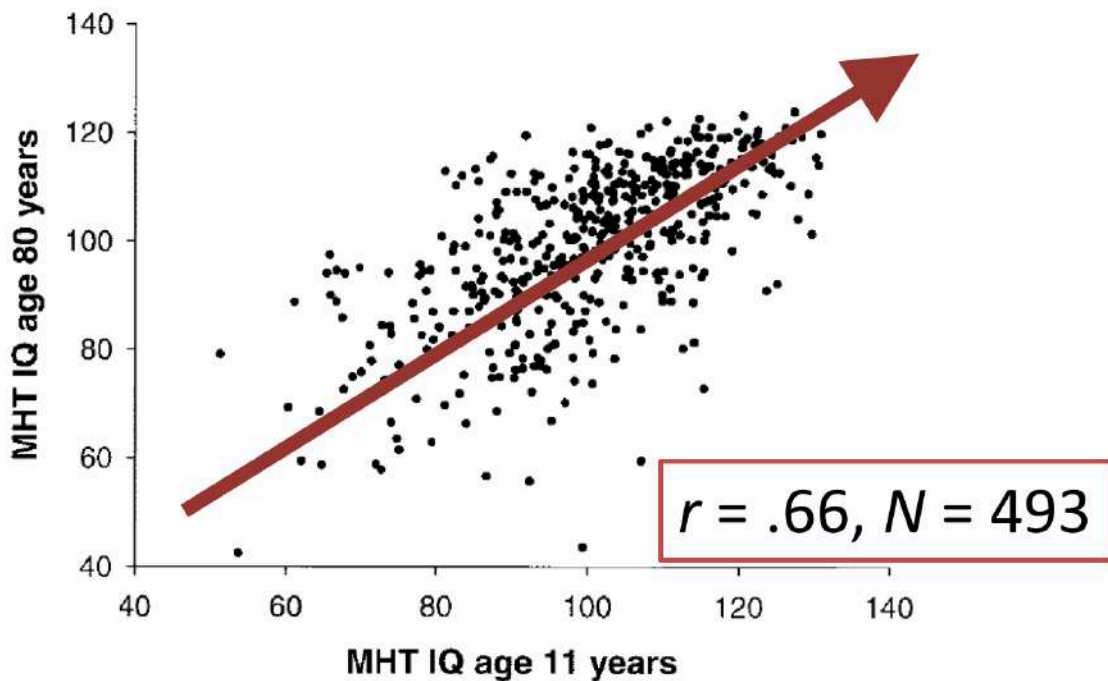


Example 2: Unstable, no change

- 5 people take an IQ test
- They take it 4 years later
- Mean IQ does not CHANGE
 - Mean (T1) = 104
 - Mean (T2) = 104
- IQ is NOT stable
 - $r = 0.06$



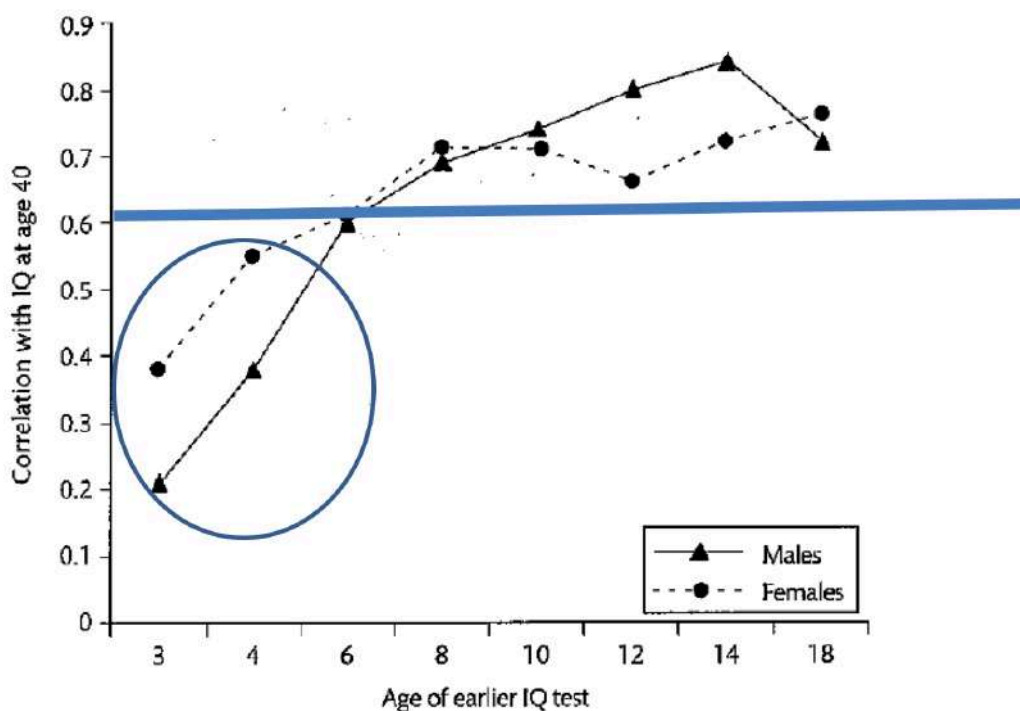
Intelligence Test Scores are Stable



Intelligence is
an enduring
trait

Figure 3. Scattergram of age-corrected Moray House Test (MHT) scores at age 11 and age 80 for participants in the Lothian Birth Cohort 1921 of the Scottish Mental Survey 1932.

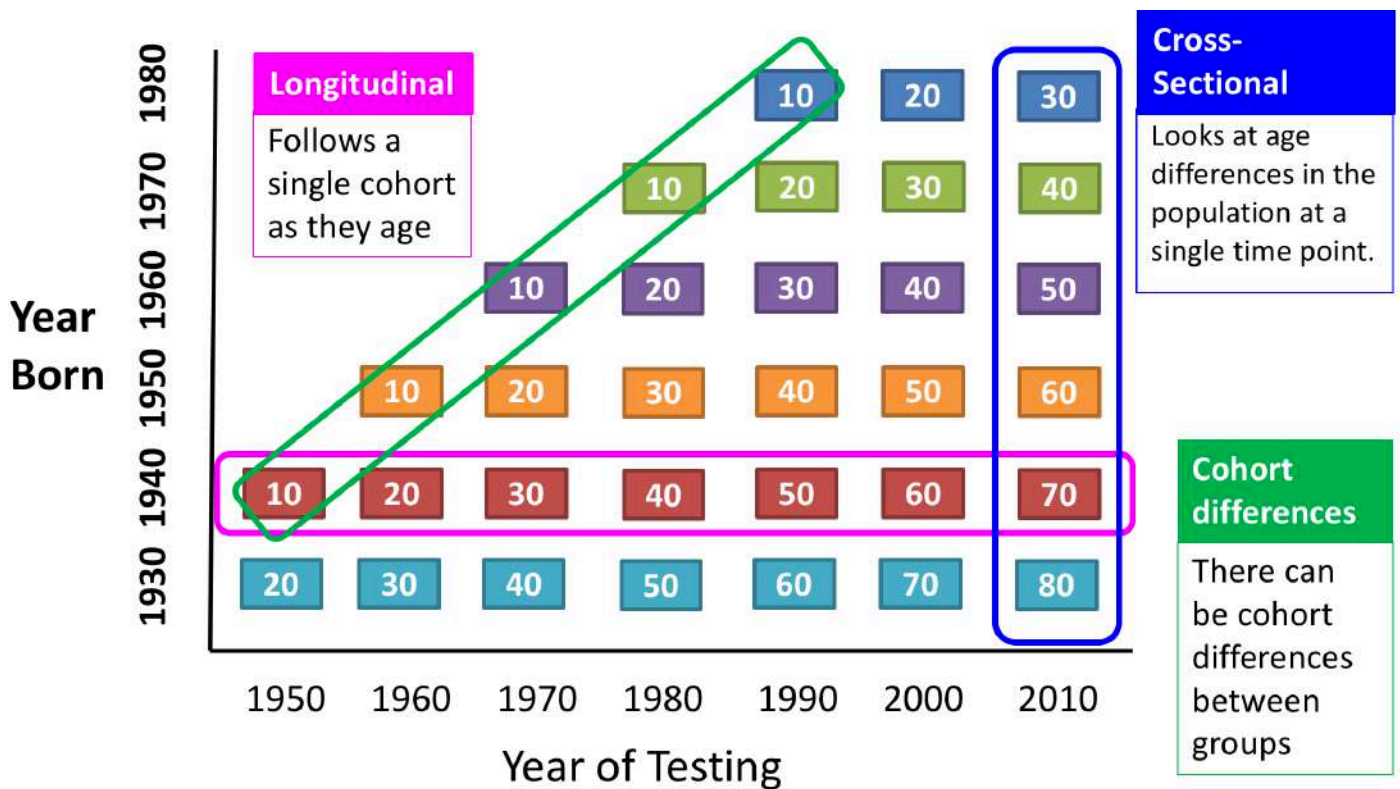
But what about very young children?



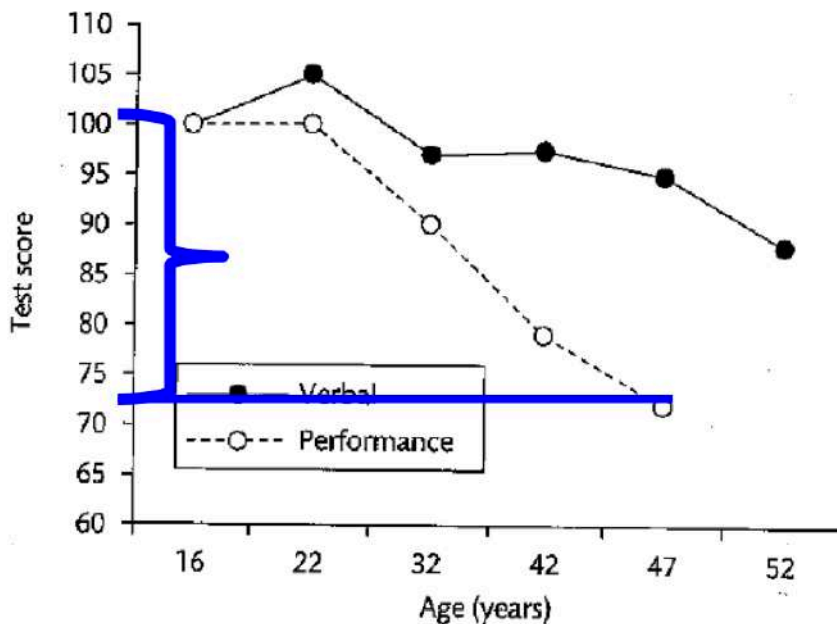
Less stability
before 6-8
years

- ❖ Mackintosh (2012). *IQ and Human Intelligence* (2nd Ed). New York, Oxford University Press.

Lifespan Research: Methods

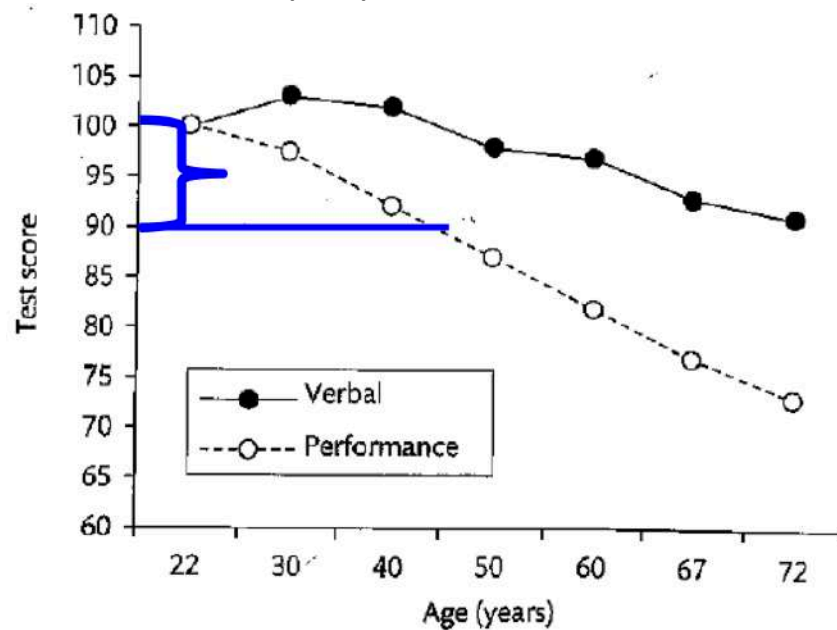


Cross-Sectional Research: The Wechsler-Bellevue Scales (1939)



- Decline on both verbal and performance IQ
- HUGE differences for performance IQ (>25 IQ points lost by age 47!!)
- ❖ Mackintosh (2012). IQ and Human Intelligence (2nd Ed). New York, Oxford University Press.

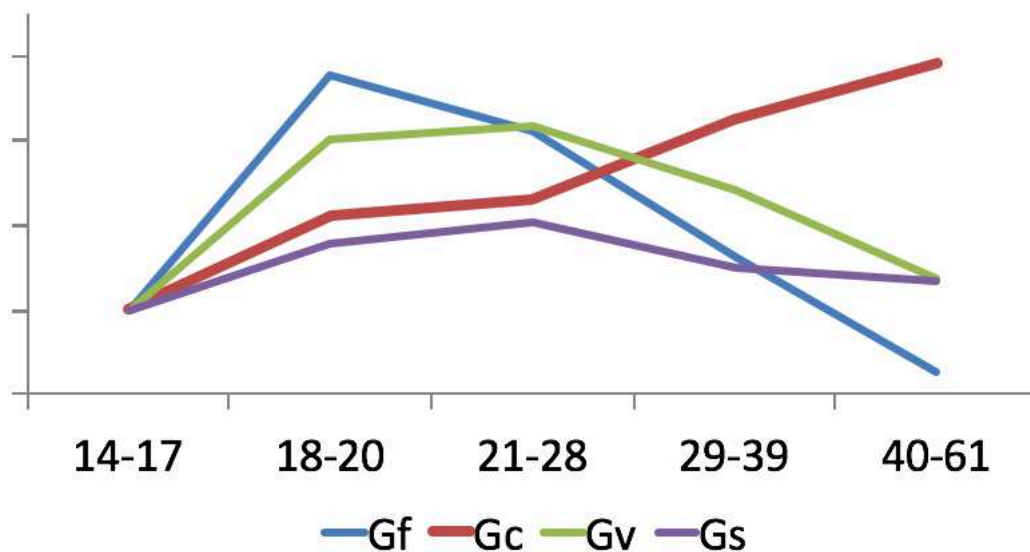
Cross-Sectional Research: WAIS-R (1981)



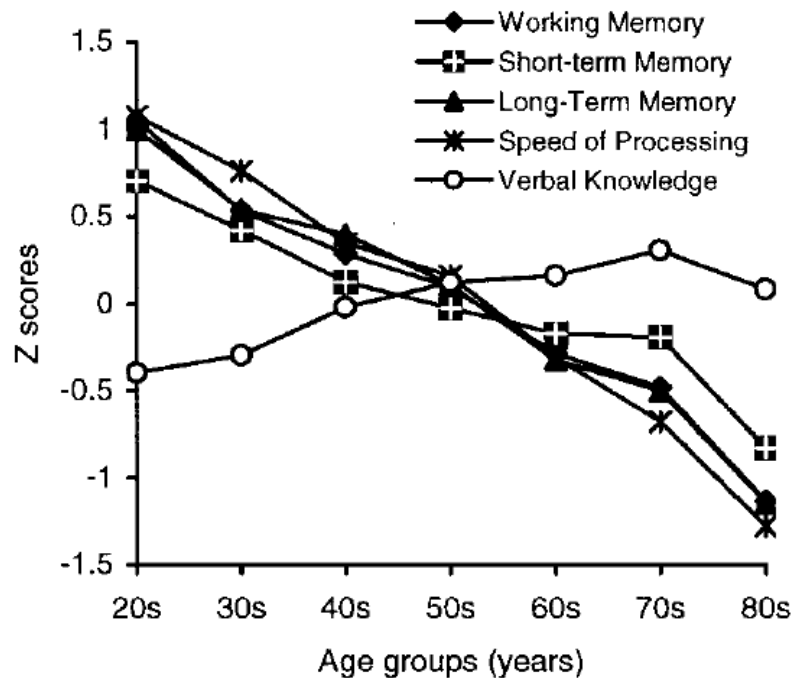
- Differences on WAIS-R Performance
 - 10 IQ points lost by age 45
 - 30 IQ points lost by age 72
- Differences on WAIS-R Verbal
 - No loss by age 45
 - ~ 7-point loss by age 72

❖ Mackintosh (2012). *IQ and Human Intelligence* (2nd Ed). New York, Oxford University Press.

Cross-Sectional Research: Age Differences Gf/Gc theory abilities



❖ Horn, J., Cattell, R. B. (1967). Age differences in fluid and crystallized intelligence. *Acta Psychologica*, 26, 107-109.



- ❖ Park, D. C., Lautenschlager, G., Hedden, T., Davidson, N. S., Smith, A. D., & Smith, P. K. (2002). Models of visuospatial and verbal memory across the adult lifespan. *Psychology and Aging, 17*, 299-320.

Why do we see such large decreases??

- IQ drops from 100 to 73 from age 16-47 [Wechsler-Bellevue]
 - An average 16-year-old declines so much that they are mentally retarded by 47?
- What has gone wrong?
- Δ AGE confounded with Δ YEAR BORN
- Difference in education:
 - < 20% finish HS 1970; ~60% finish HS 2010
- Flynn effect: 3 IQ points per decade
 - 45 yo score 74 because they are 45 VS
 - The group of 45-year-olds would always have scored 74 (even when they were 16)?



COHORT EFFECTS

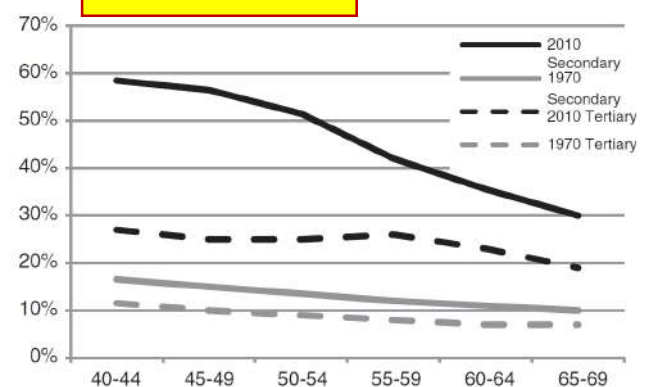
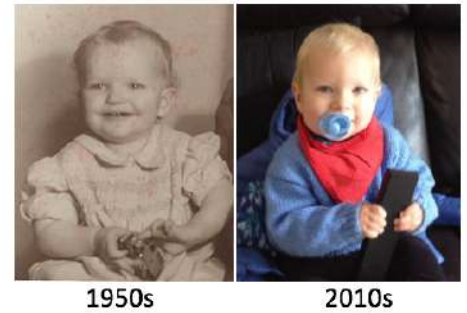


Fig. 1. Education by age (both sexes), UK, 1970 and 2010.

Cross-Sectional vs Longitudinal Research

Cross-Sectional

- Cohort Differences
 - Education
 - Technology/complexity
 - Particular events (e.g., 1930s depression; WW1 conscription etc.)
 - Flynn effect
 - Test/testing familiarity
 - Age of retirement
 - % of women in workforce
 - # of children per family
 - Maternal age



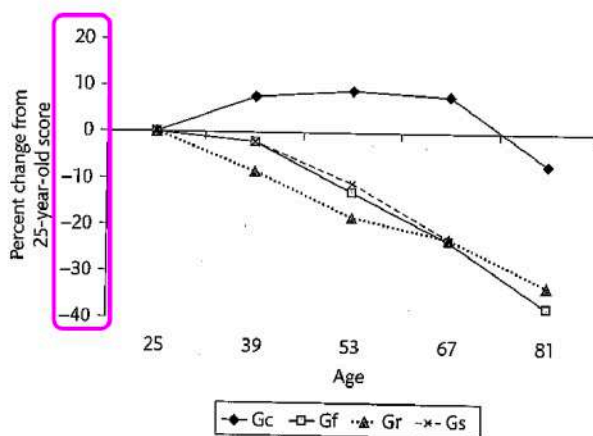
1950s

2010s

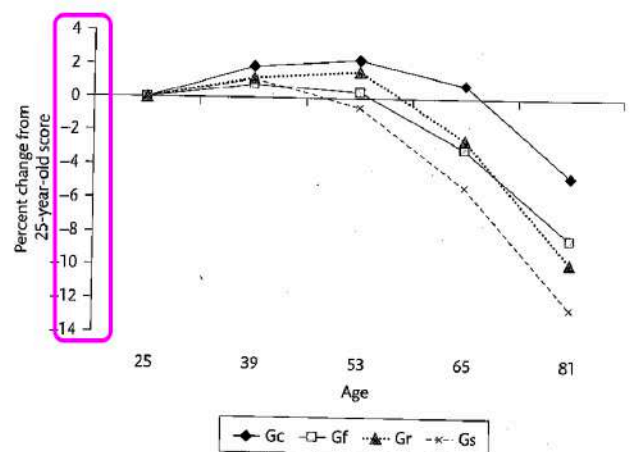
SO LONGITUDINAL
MUST BE A BETTER
RESEARCH DESIGN?

Compare Longitudinal vs Cross-Sectional

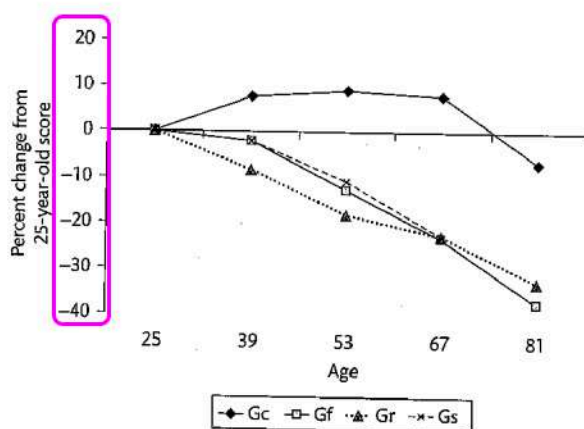
Cross-Sectional



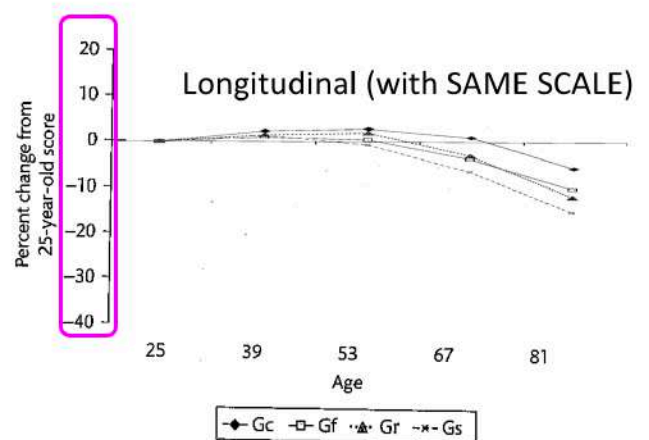
Longitudinal



Cross-Sectional



Longitudinal



- Cross-Sectional Research Over-Estimates Cognitive Decline
- BUT different sizes for different cohorts

- SEATTLE STUDY: N=500 20-80yo in 1956
- Followed every 7 years; + new cohort every 7 years
- ❖ Schaie, K. W. (2005). *Developmental influences on adult intelligence: The Seattle Longitudinal Study*. Oxford, Oxford University Press.

Why don't we just look at longitudinal?

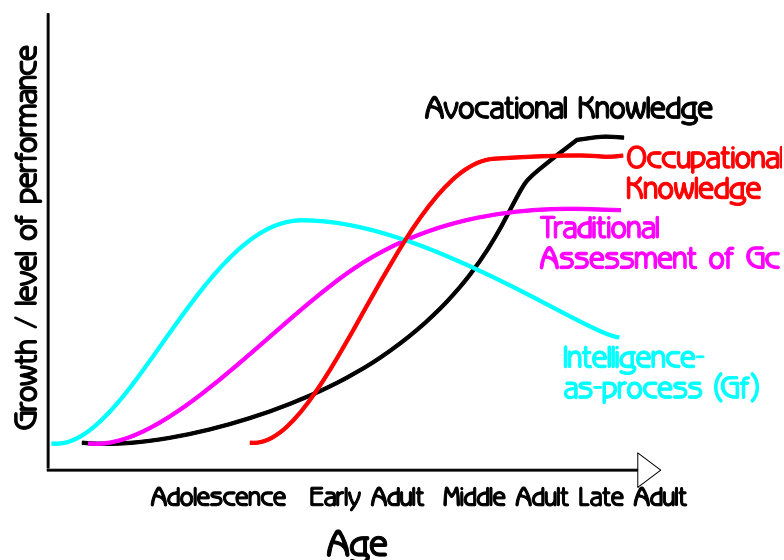
Longitudinal

- Updated tests/measures
- Retest effects
- Selective Attrition
- Takes a lifetime to do...
- Retest – likely *inflates* scores at higher ages (also boredom/motivation)
 - *under-estimates cognitive decline*
- Selective attrition – intelligence relates to health/death, incarceration, geographic mobility, etc.
 - *under-estimates cognitive decline*

Should we be worried about the aging workforce?

World power-brokers are generally over 60

- Role of *domain specific knowledge*
- Domain specific knowledge increases across the lifetime
- Role of *expertise*
- Deliberate practice of 10,000 hours or more
- Strategies for successful performance shift to domain specific knowledge and expertise



- ❖ Ackerman, P. L. (1996). A theory of adult intellectual development: Process, Personality, Interests, and Knowledge. *Intelligence*, 22, 227-257.

❖ Further Resources:

- Deary, I. J. (2012). Intelligence. *Annual Review of Psychology*, 63, 453–482. [Aging section from p. 470]
- Mackintosh (2012). *IQ and Human Intelligence* (2nd Ed). New York, Oxford University Press. [Ch 8; The Stability of IQ and the Rise and Fall of Intelligence]

🎨 Sample Questions:

Q1.

- Name the two research designs that can be used to study age differences in intelligence.
- Briefly describe each of these designs.
- Briefly state the research findings on age differences in intelligence for each of these designs.
- Critically evaluate the strengths and weaknesses and each of these designs.

Q2.

- Define stability and change as they apply to individual differences in intelligence.
- What evidence is there that intelligence changes?
- What evidence is there that intelligence is stable over time?

Q3.

- Briefly describe cross-sectional and longitudinal methods for examining age differences.
- What are the weaknesses of cross-sectional research?
- What are the weaknesses of longitudinal research?
- How do the major group factors of intelligence change across the lifespan?