

# Deliberate Practice and Expertise

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How People Learn I

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- Learning is associated with:
  - Intellectual ability (correlation with attainment  $r = .5$ ; 25% of variance explained)
  - Something to do with personality:
    - Being strategic? (correlation  $r =$  about .15)?
    - Conscientiousness? (correlation  $r =$  about .24)?
    - Self-Disciplined? (correlation  $r =$  about .32)?
  - We seem to be moving closer to ‘something’...

# Studies of expertise

- What you already know (from chess studies)...
  - Experts know a lot
  - Experts learn new information quickly
  - Experts recall information in chunks
  - These two facts suggest experts have **knowledge organised** in schema

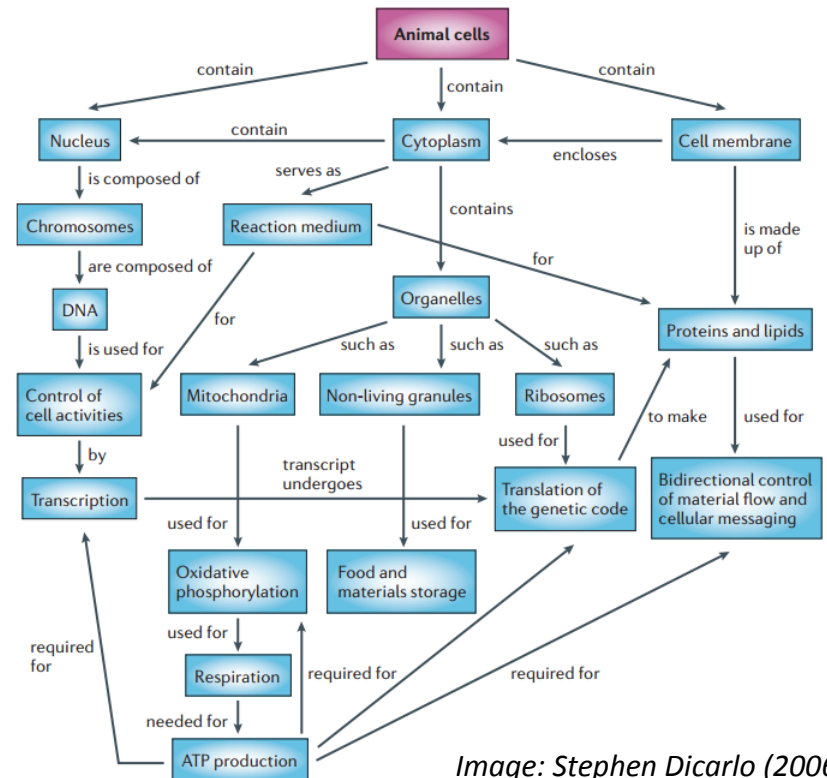


Image: Stephen Dicarlo (2006)  
*Nature Reviews Molecular Cell  
Biology* 7, 290-296

# Ericsson's studies of expertise

- Studies may over estimate the importance of intelligence on performance
  - Intelligence is strongly correlated with *initial* performance, but less so with *experienced* performance
  - Expert performance typically comes after many years of practice
    - Average of 11.7 years from learning rules of chess to becoming international master (Krogius, 1976)
    - Composers show average 10 years between starting to study music and first eminent composition (Hayes, 1981)
    - Similar pattern for mathematics (Gustin, 1985), tennis (Monsaas, 1985), swimming (Kalinowski, 1985), and long-distance running (Wallingford, 1975)

- ...“expert performance is acquired slowly over a very long time as a result of practice and that the highest levels of performance and achievement appear to **require at least around 10 years of intense prior preparation**” (Ericsson et al, 1993)
- (10,000 hours)



Picture from flickr Peter Voerman (creative commons)



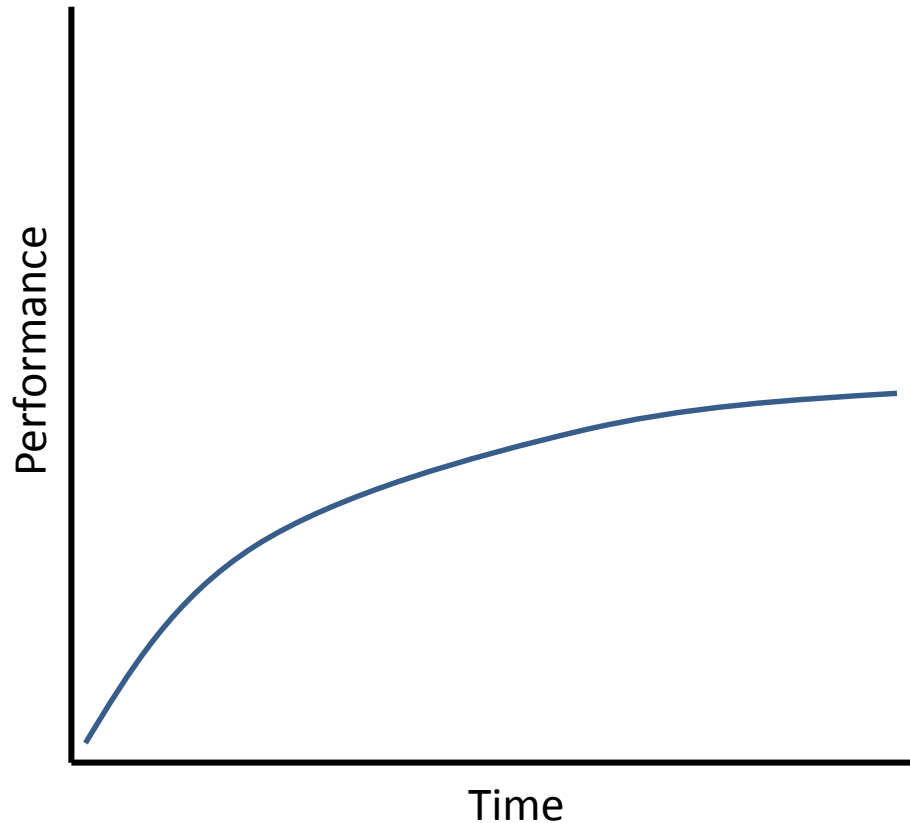
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- Practice on average...
  - 10,000 hours for best violinists by age 20
  - 7,500 for good violinists
  - 5,000 for average violinists
- 10,000 hours = 2 hours 45 minutes per day X 10 years
- (these are averages)



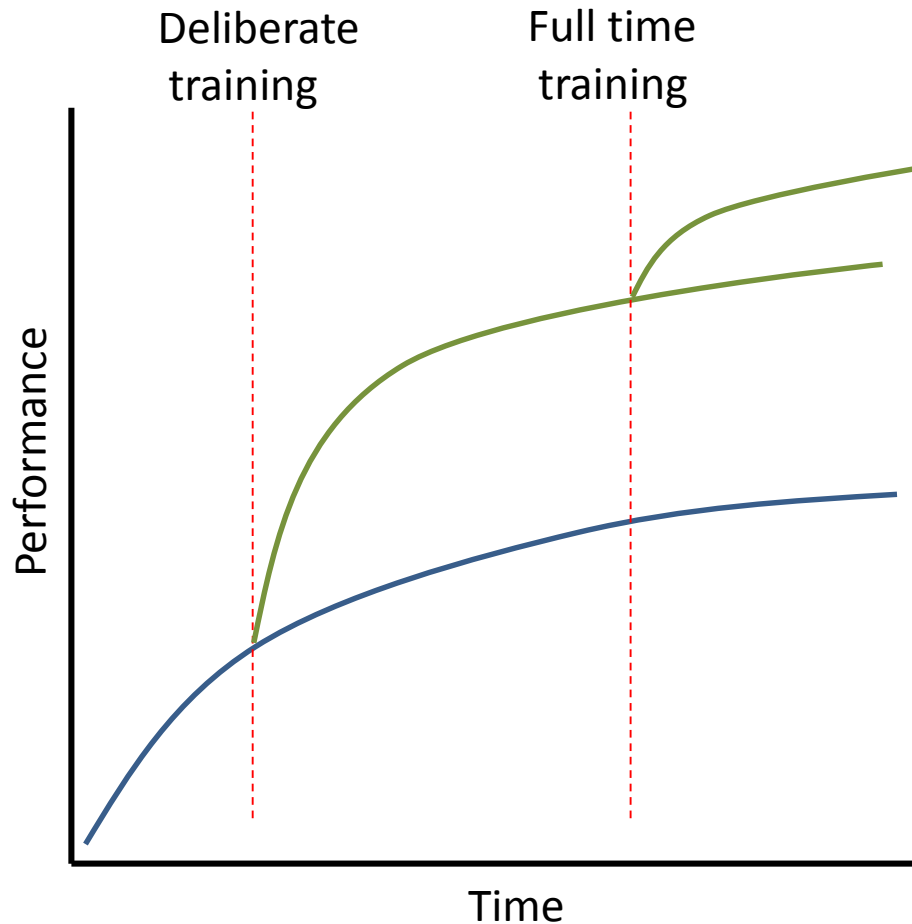
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# Is 10,000 hours practice enough?



- Performance can improve rapidly in early stages, reaching a plateau
- Often understood as maximum innate ability

# Is 10 years practice enough?



- Ericsson identified different pattern
- Stagnation for those who engage in **work or play**
- Improvement for those who engage in **Deliberate Practice**



# Deliberate practice

- Deliberate practice (Ericsson, 1993)
  - ...engagement in **highly structured activities** that are created specifically to improve performance in a domain through **immediate feedback**, that require a high degree of concentration, and that are **not inherently enjoyable**

# Building deliberate practice

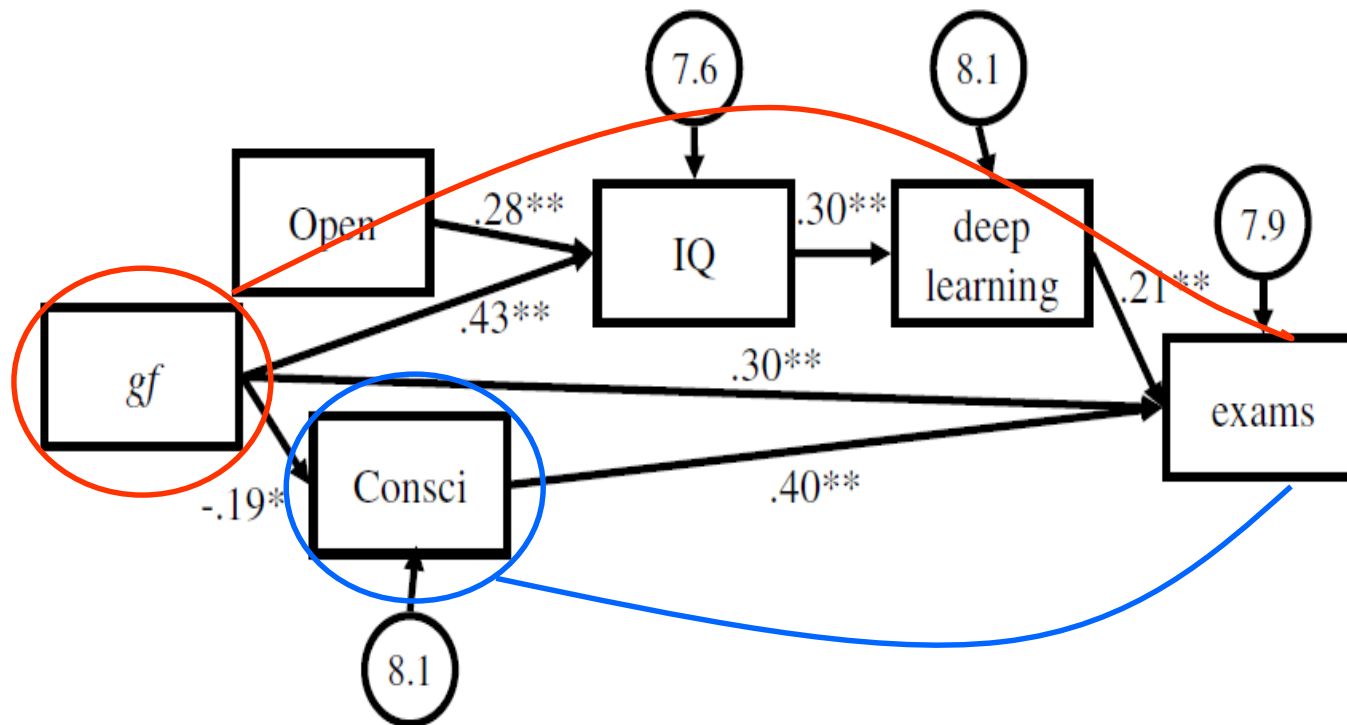
- Start with shorter practice periods (30 minutes per day)
  - build habit of regular practice
  - Increase practice times slowly
- Mastery goals drive motivation
  - Constant mini goals ('getting better') and feedback (score)



Picture from flickr Ian Turk (creative commons)

# Does schooling teach some of us the opposite?

[Chamorro-Premuzic & Furnham 2008](#)

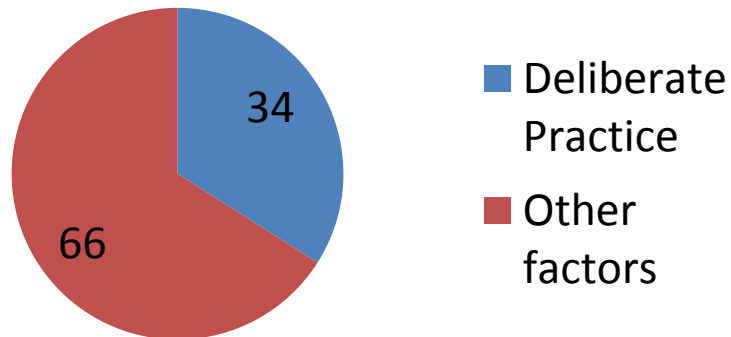


# Weaknesses of expertise

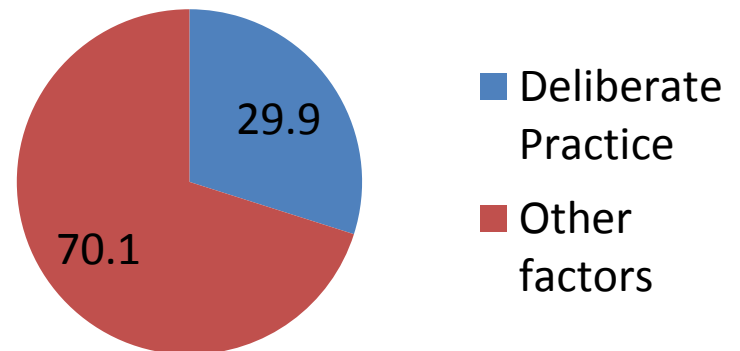
- Expertise of psychotherapists vs. expertise of firefighters (Kahneman, 2011)
- Immediacy of accurate feedback key to expertise in making good intuitive judgements

# Is deliberate practice all it takes?

**Chess expertise % variance explained**



**Music expertise % of variance explained**



- 34% of variance explained means  $r=.58$
- 29.9% of variance explained means  $r=.55$

Hambrick et al. (2013)

# Conclusion

- ‘Strategic Approach to Learning’ and ‘Conscientiousness’ data point to ‘something’
- Studies on expertise suggest the something is ‘deliberate practice’
  - Elements of striving, self-discipline
  - Also elements of metacognition
- Key to deliberate practice is the role of the coach/teacher – that is where we turn next