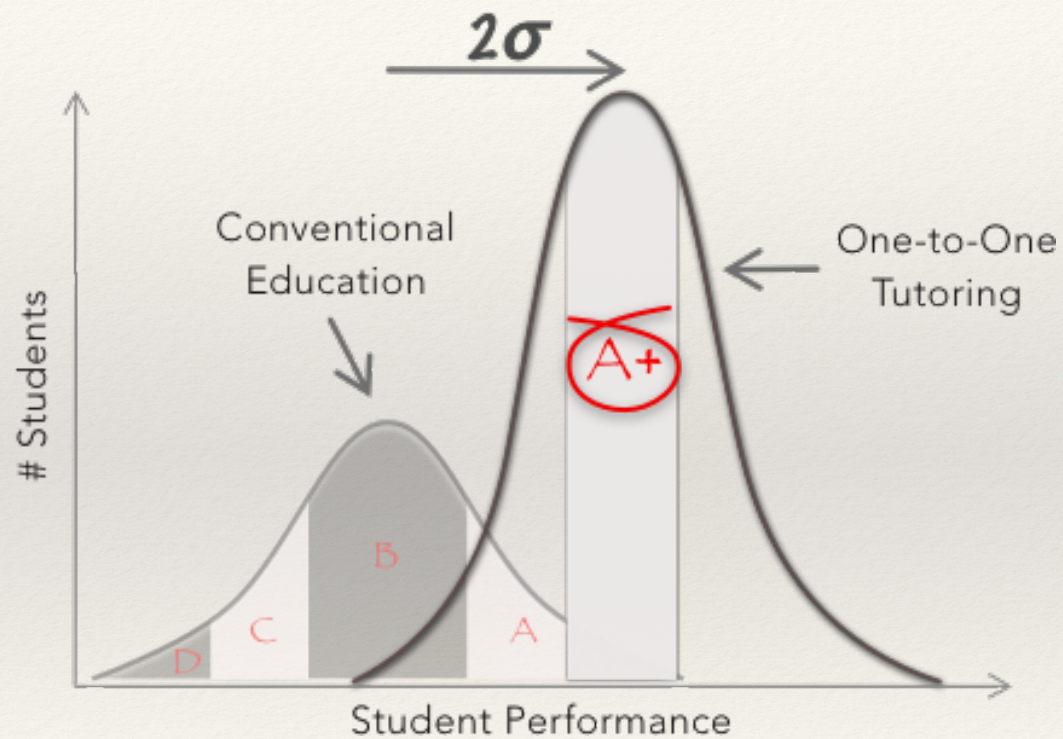# Precision Education

Education models

Bloom, the 2 sigma problem (1984)

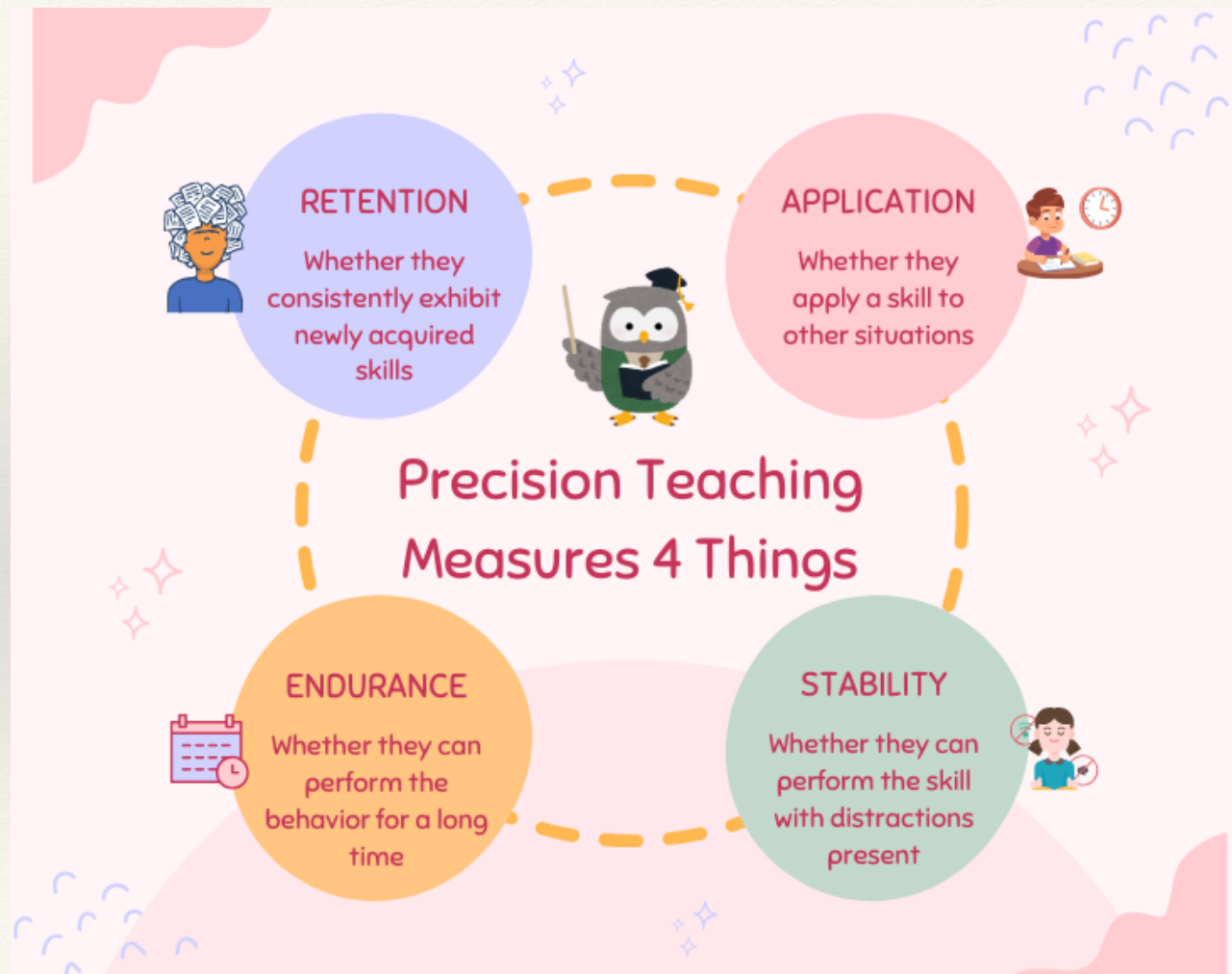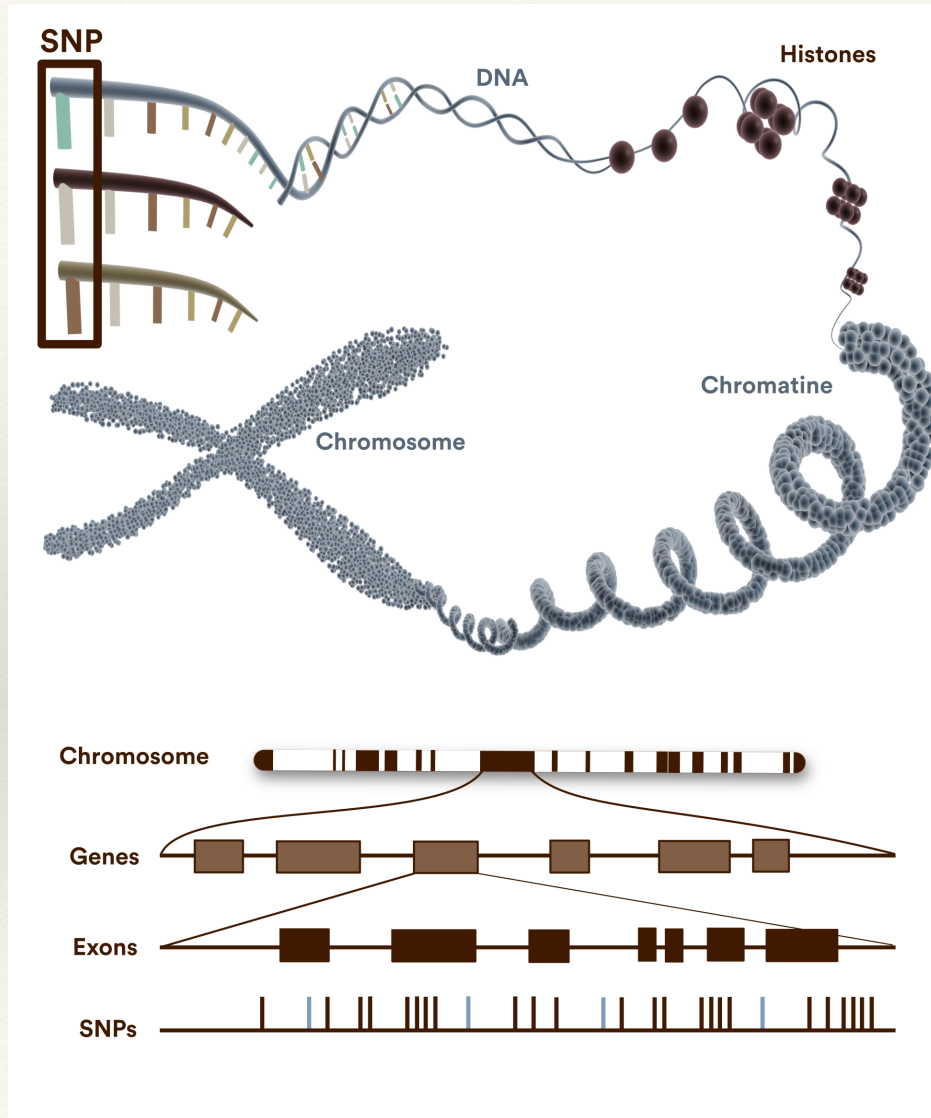# Cartoon of the day

By the way, ChatGPT misspelled your name.

Precision Education

SNP

DNA

Histones

Chromatine

Chromosome

Chromosome

Genes

Exons

SNPs

Polygenic Score

Discovery GWAS
$N = 30K–1,000K$

SNP	$\hat{b}$
rs5	0.013
rs26	0.011
rs47	0.0001
. . .	
rs9999	0.002

Polygenic Scoring
$N = 300+$

SNP	Alleles	$\hat{b}$
rs5	0	0.013
rs26	1	0.011
rs47	2	0.0001
. . .		
rs9999	1	−0.001

Population Frequency

$$\sum_{j=1}^{J} \hat{b}_j \times \text{alleles}_{ij}$$
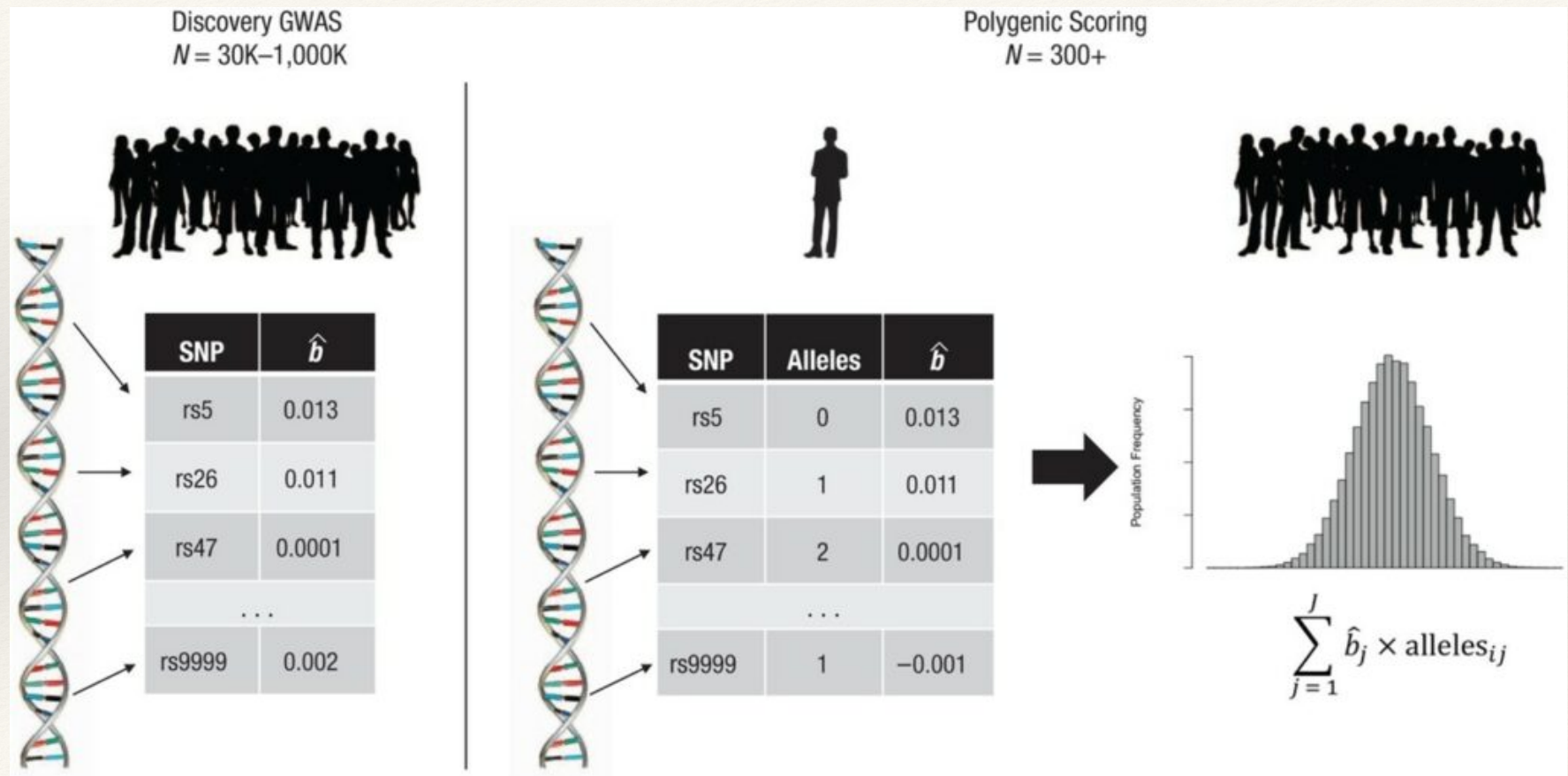
FUTURE TRENDS OF POLYGENIC RISK SCORE

ECONOMIC
- Cost reduction
- Direct-to-consumer genetic testing services

ETHICAL
- Mitigate the current ancestry bias
- Develope ethical guidelines
- Advanced privacy-preserving technologies

SCIENTIFIC
- Enhance predictive accuracy via the expansion of GWAS
- Multi-ancestry database via biobanks
- Early interventions

USABILITY
- Policy considerations
- Insurance coverage
- Reimbursement strategies

TRENDS
- Effective communication and interpretation
- Risk of biased information dissemination

APPLICATION
- Integrate with model gene-gene or gene-environment
- Integrate with multi-omics and the exposome
- Personalized treatment