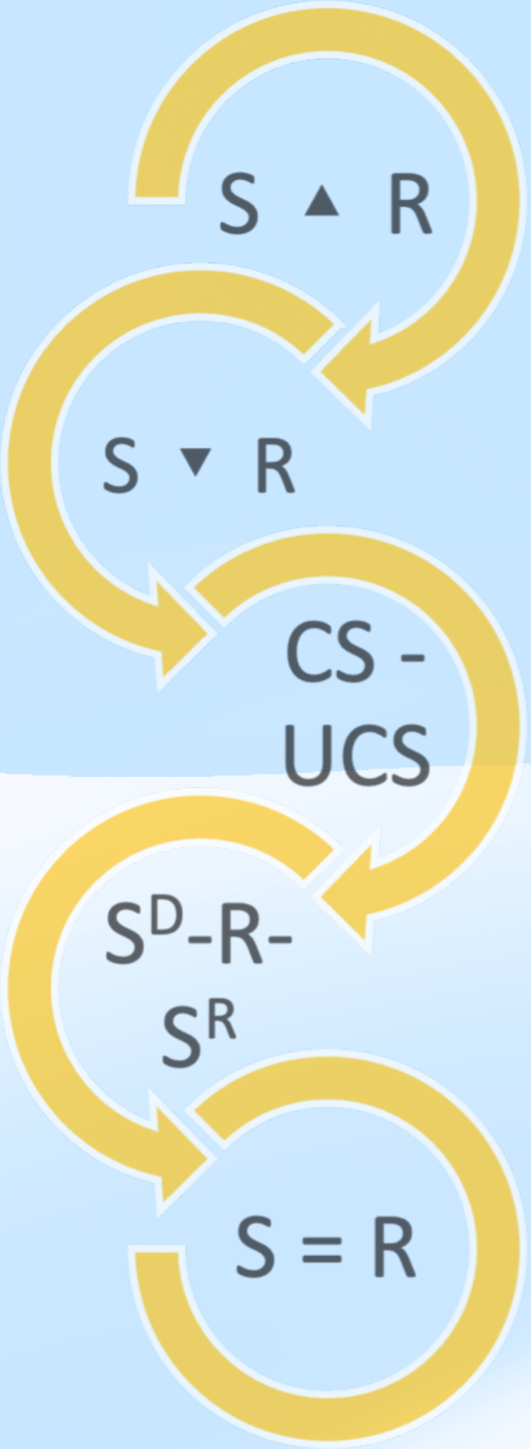
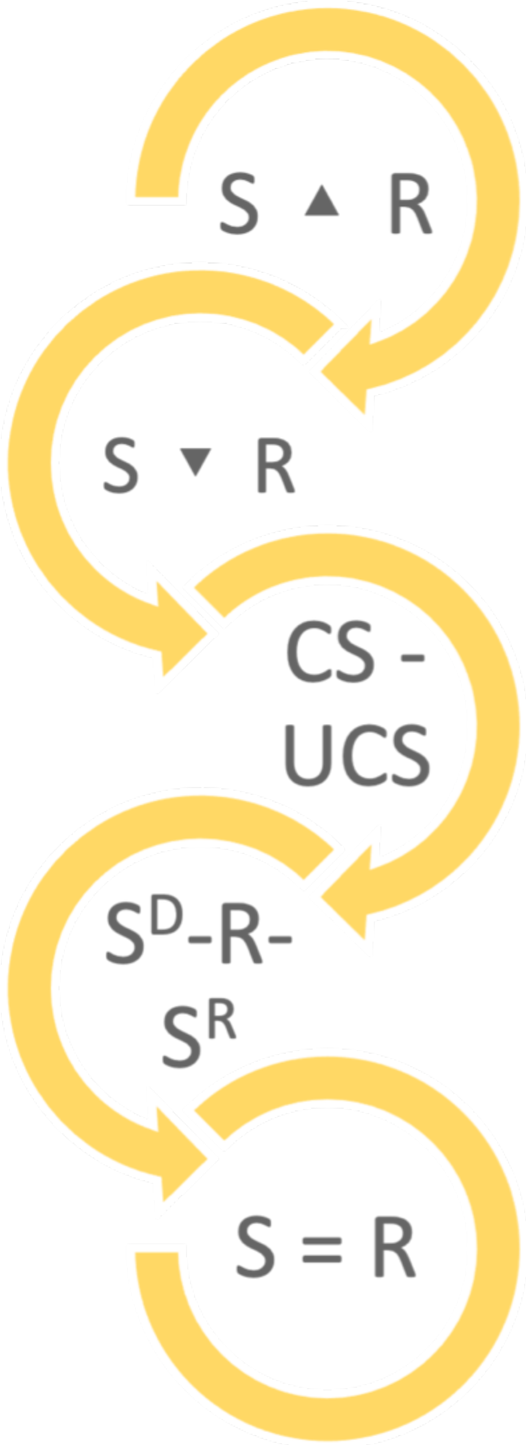


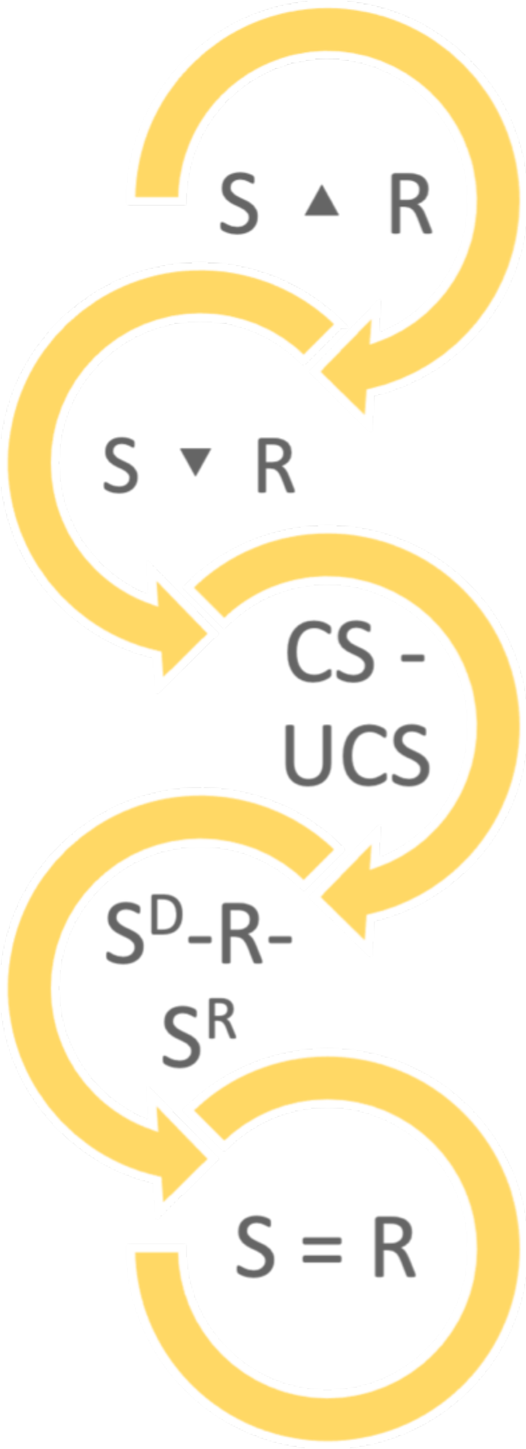
Hjernen, (læring) og atferd

- Er det nødvendig å vite noe om hjernen og sentralnervesystemet for komplettere en vitenskap om atferd?

Søren J. Skår, Psykolog og atferdsanalytiker

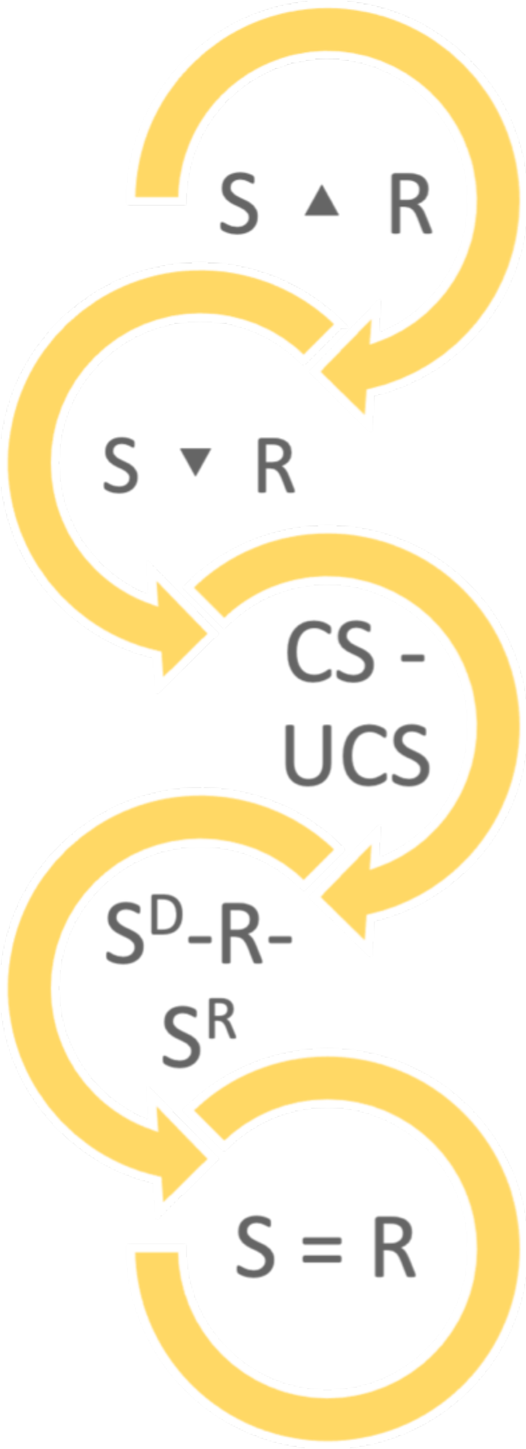


Spørsmålet i programmet lyder: *Er det nødvendig å vite noe om hjernen og sentralnervesystemet for å komplettere en vitenskap om atferd?*

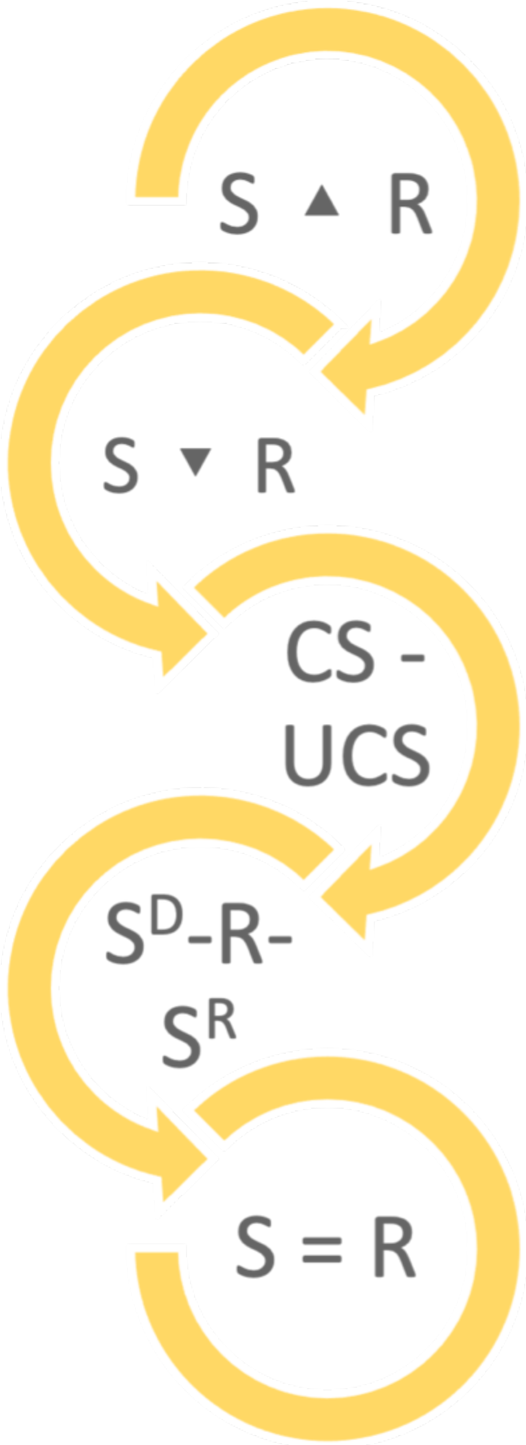


Spørsmålet i programmet lyder: *Er det nødvendig å vite noe om hjernen og sentralnervesystemet for å komplettere en vitenskap om atferd?*

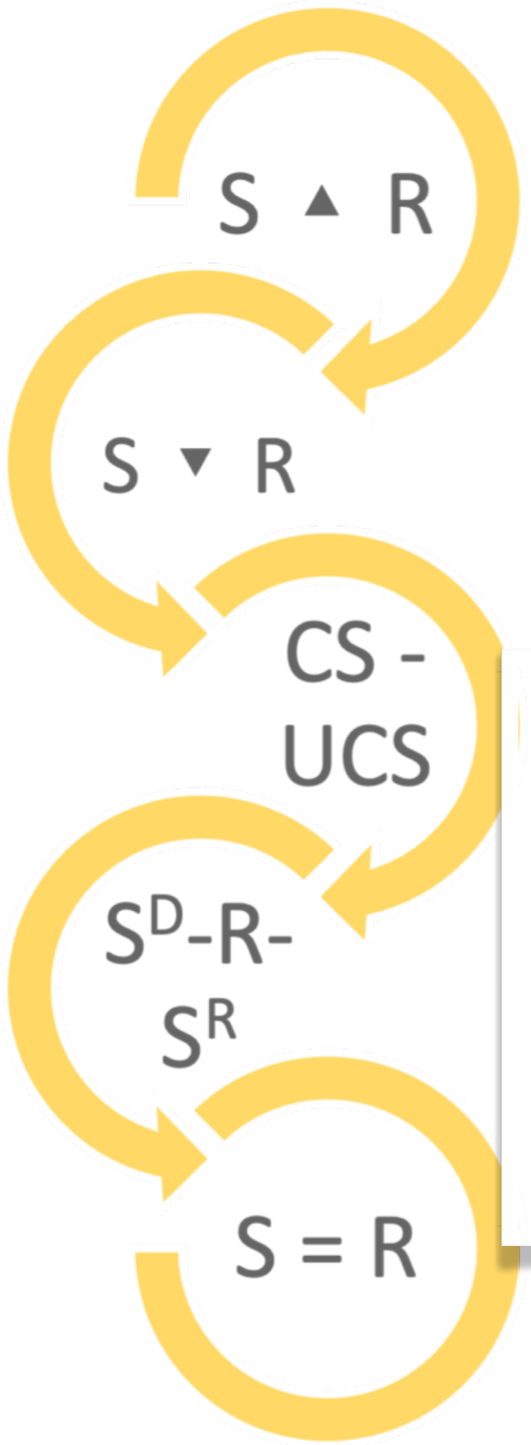
Fortolkning	Typisk svar	Min posisjon
For å kunne drive god ABA-praksis	Nei — du trenger ikke nevrobiologi for å analysere og endre atferd funksjonelt	Enig — dette er en faglig ryddig og stadig gyldig posisjon
For å ha en komplett vitenskap om atferd som naturfenomen	Nei - atferd produseres ikke innenfra	Ja — atferd kan ikke fullt forklares uten det substratet det utspilles på



Behavioranalysen og nevrovitenskapen deler det samme metavitenskapelige rammeverket — **seleksjonisme** (Donahoe 2017)

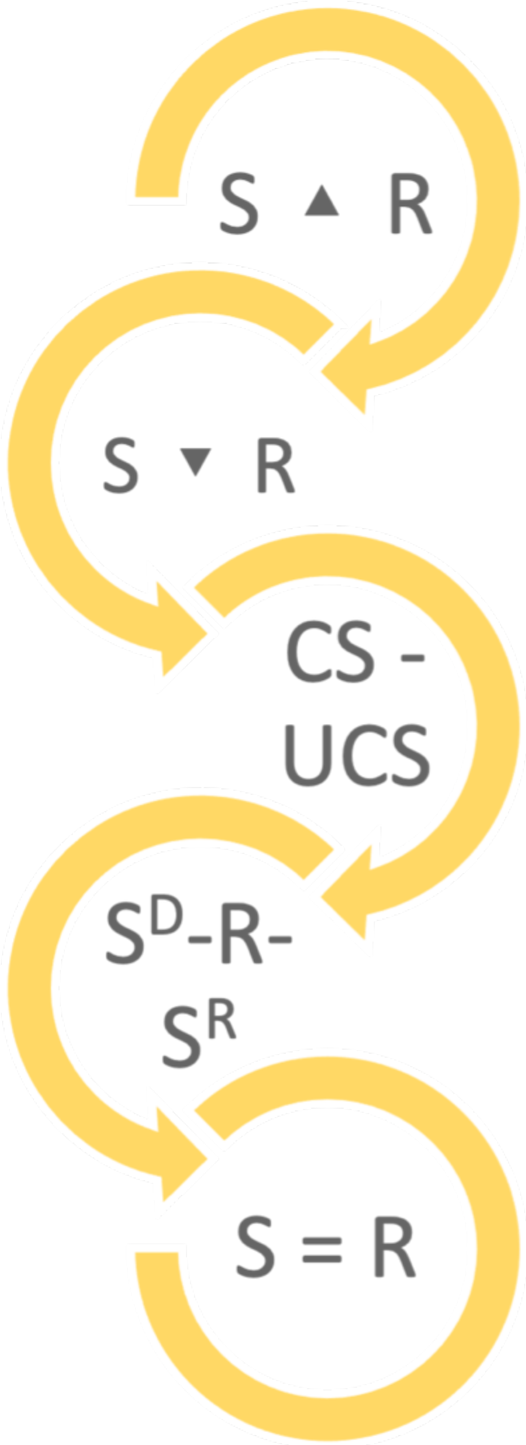


«Men Skinner sa at vi ikke trenger å se inn i organismen.»

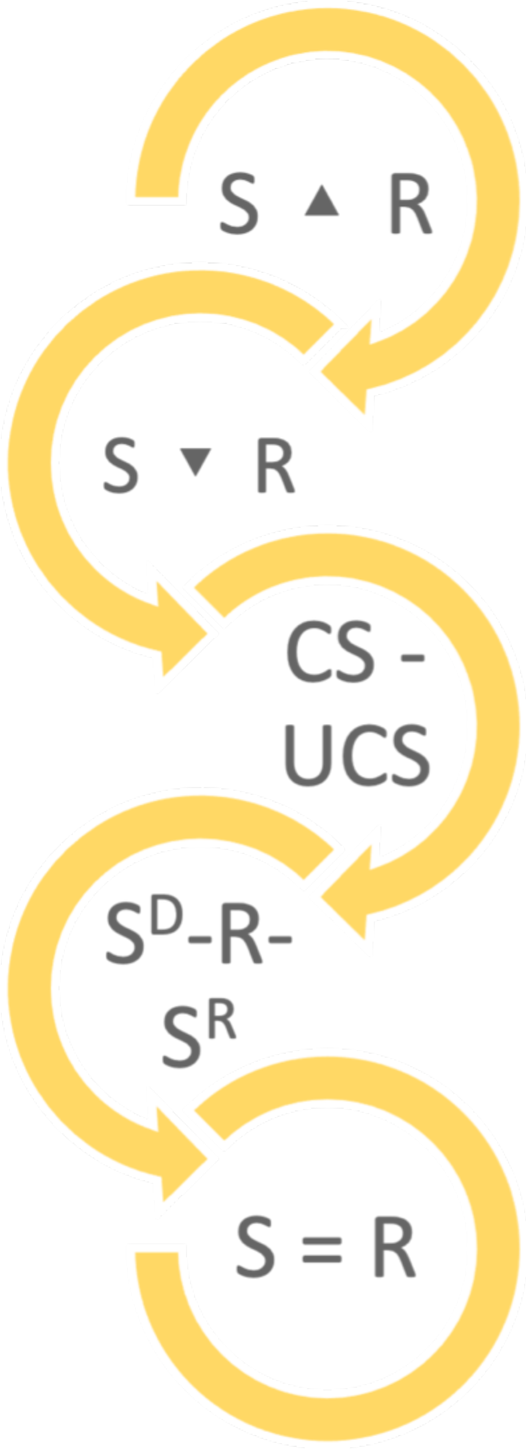


«Men Skinner sa at vi ikke trenger å se inn i organismen.»

Skinner skilte mellom **conceptual nervous system** (hypotetiske forklaringer han avviste) og **physiological nervous system** (virkelige mekanismer som kunne utforskes). Han sa eksplisitt at den dagen vi har metoder til å undersøke hjernen direkte, vil det utdype — ikke erstatte — atferdsvitenskap. (Science and Human Behavior, 1953.)



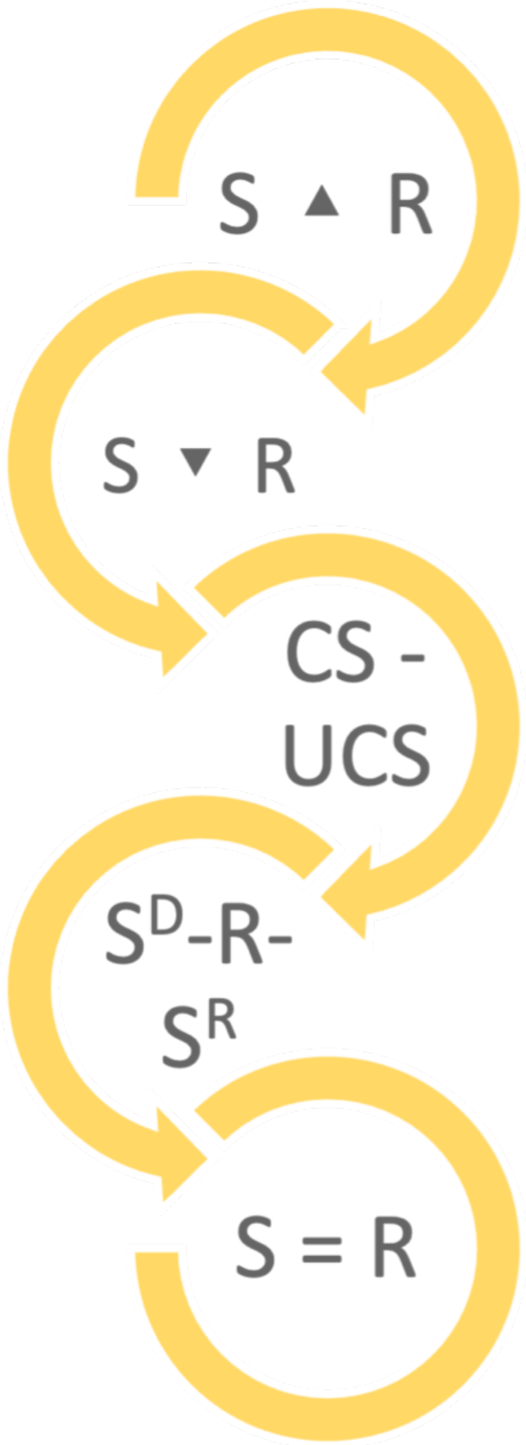
«Hvorfor bry oss om celler — vi har da effektive tiltak uten.»



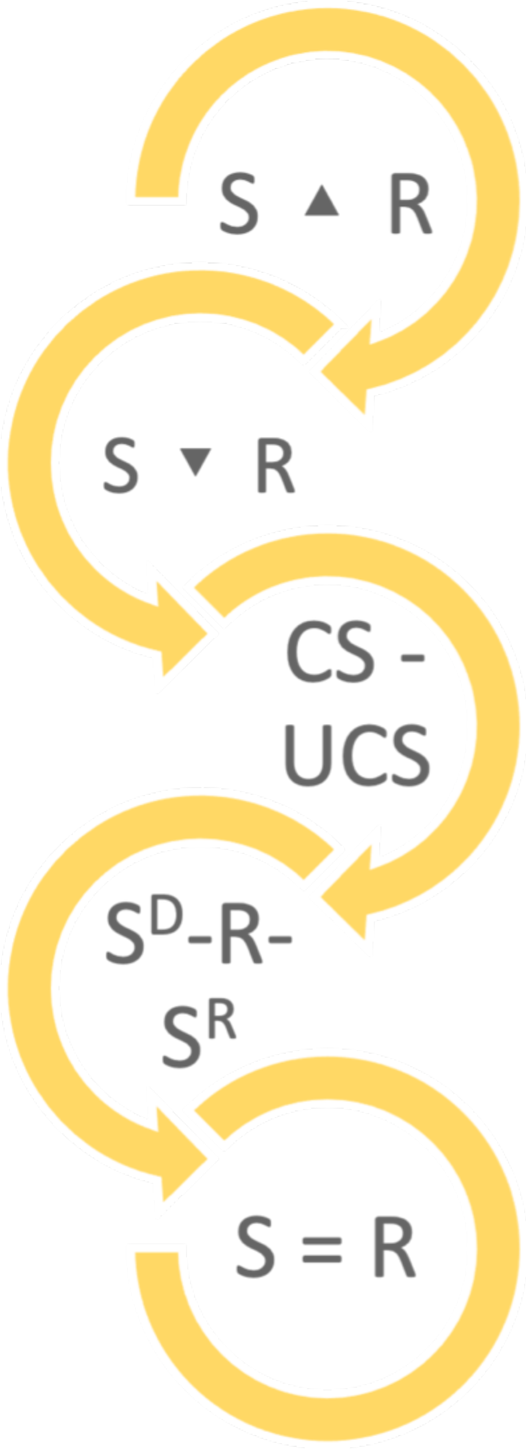
Hvorfor bry oss om celler — vi har da effektive tiltak uten.»

Effektive tiltak er helt uavhengige av cellulær forståelse. **Men vitenskapen om atferd er et annet prosjekt enn praksisen.**

Vitenskapen trenger nevrobiologisk substrat



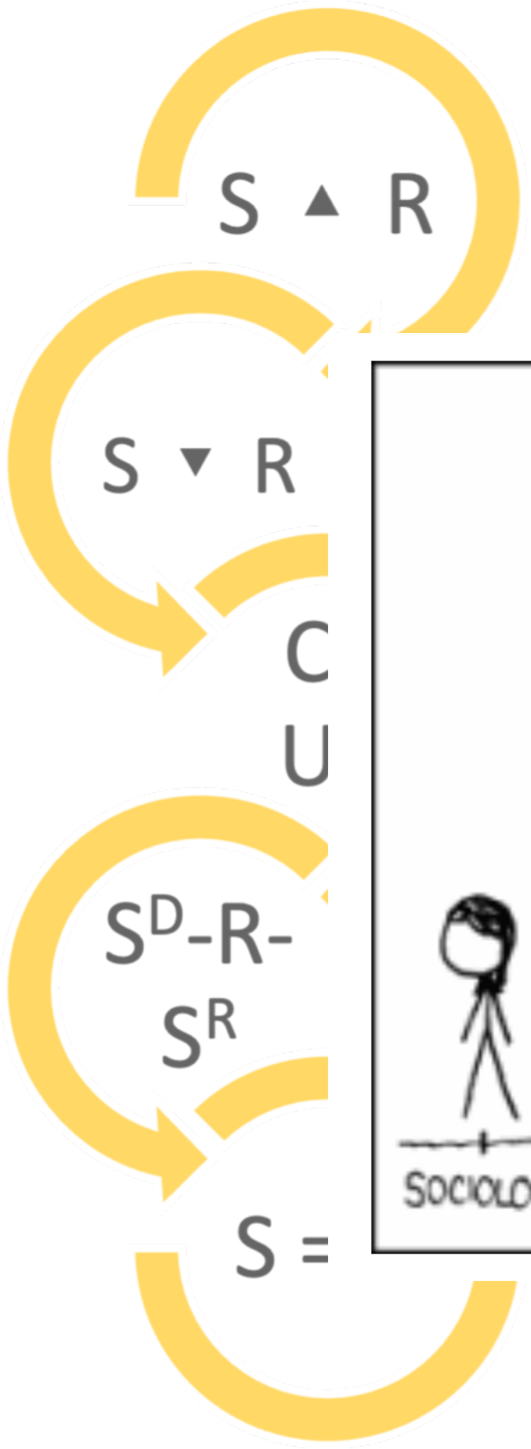
«Blir ikke dette reduksjonisme?»

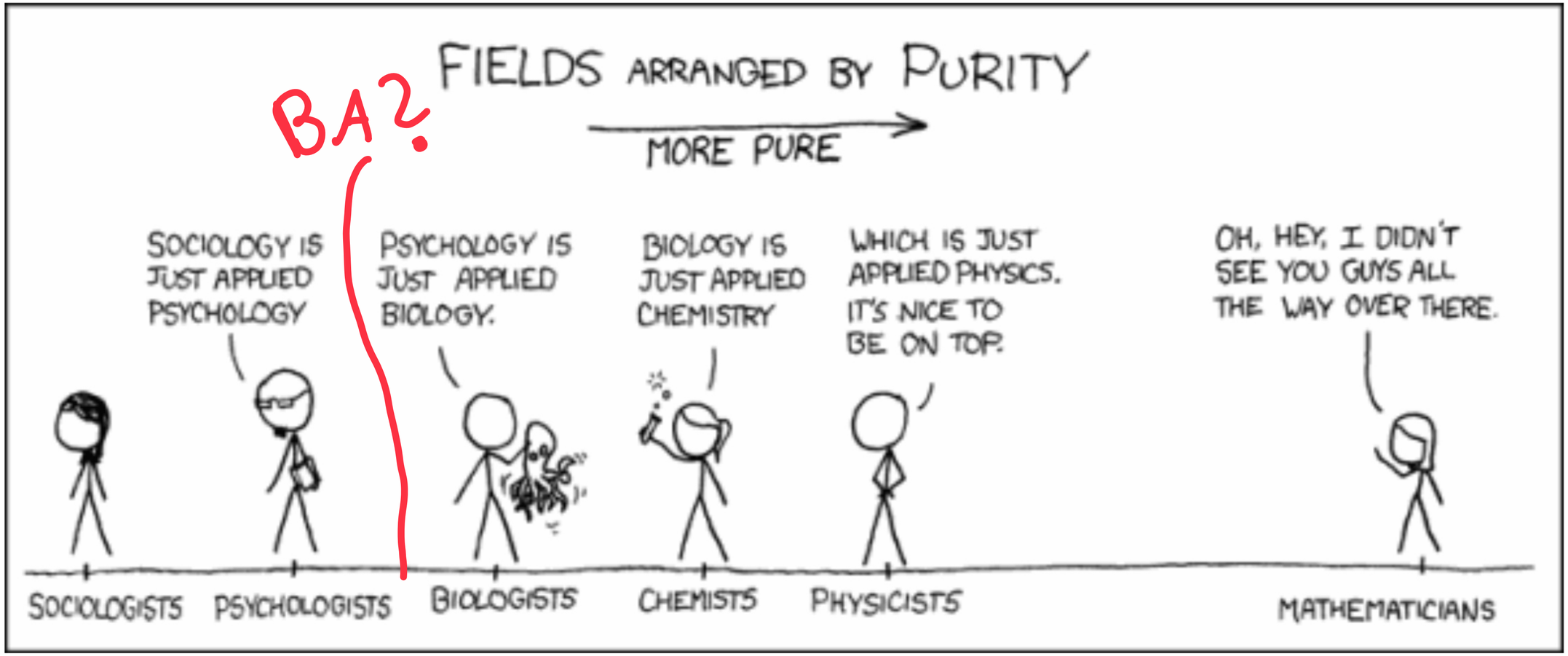


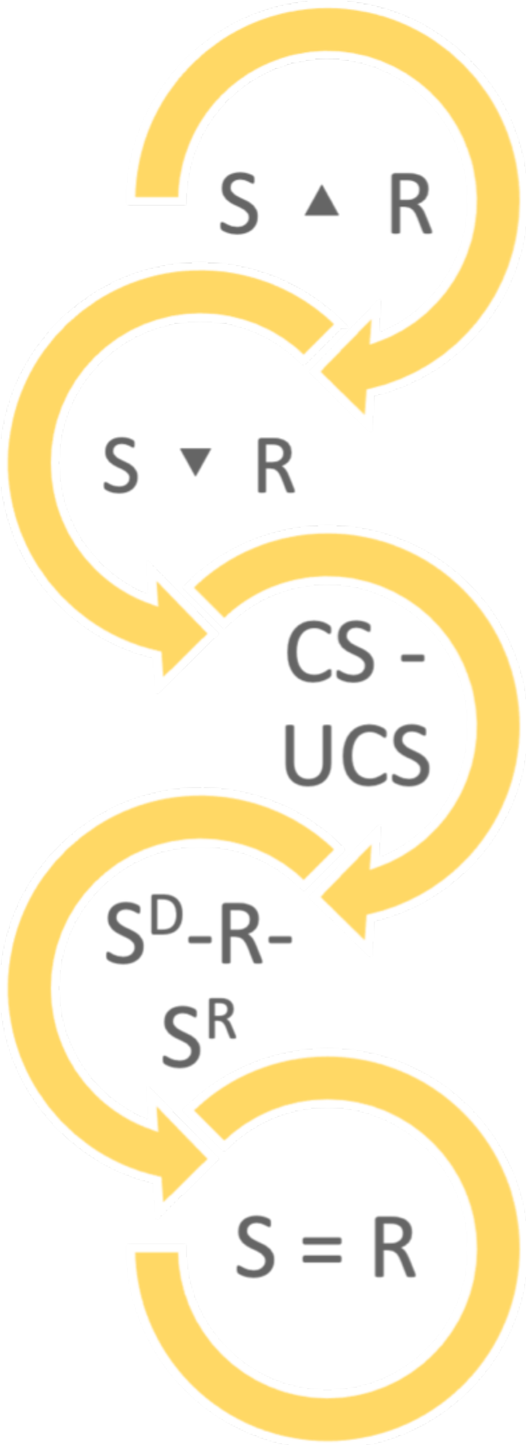
«Blir ikke dette reduksjonisme?»

Nei — komplementær multiskala-forklaring. Atferd eksisterer på organism- og cellenenivå; mekanismene eksisterer på celle- og kretsnivå. Forklaring på det ene nivået erstatter ikke det andre (Donahoe 2017).

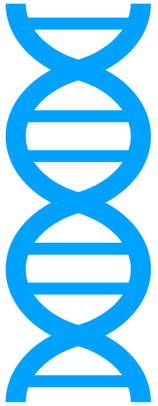
Hva er ABA?


S ▲ R
S ▼ R
C
U
S^D-R-
S^R
S =

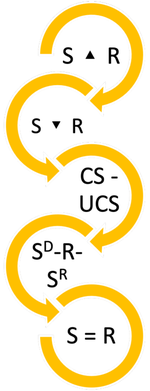

FIELDS ARRANGED BY PURITY
MORE PURE
BA?
SOCIOLOGY IS JUST APPLIED PSYCHOLOGY
PSYCHOLOGY IS JUST APPLIED BIOLOGY.
BIOLOGY IS JUST APPLIED CHEMISTRY
WHICH IS JUST APPLIED PHYSICS. IT'S NICE TO BE ON TOP.
OH, HEY, I DIDN'T SEE YOU GUYS ALL THE WAY OVER THERE.
SOCIOLOGISTS
PSYCHOLOGISTS
BIOLOGISTS
CHEMISTS
PHYSICISTS
MATHEMATICIANS



Hva er ABA?

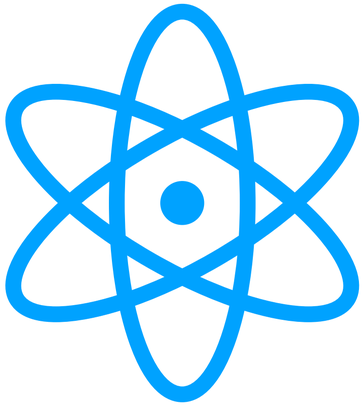


Biologi

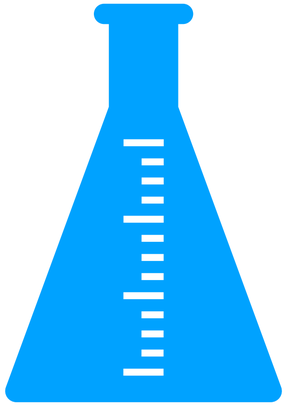


Behaviorologi

(Atferdsanalyse)



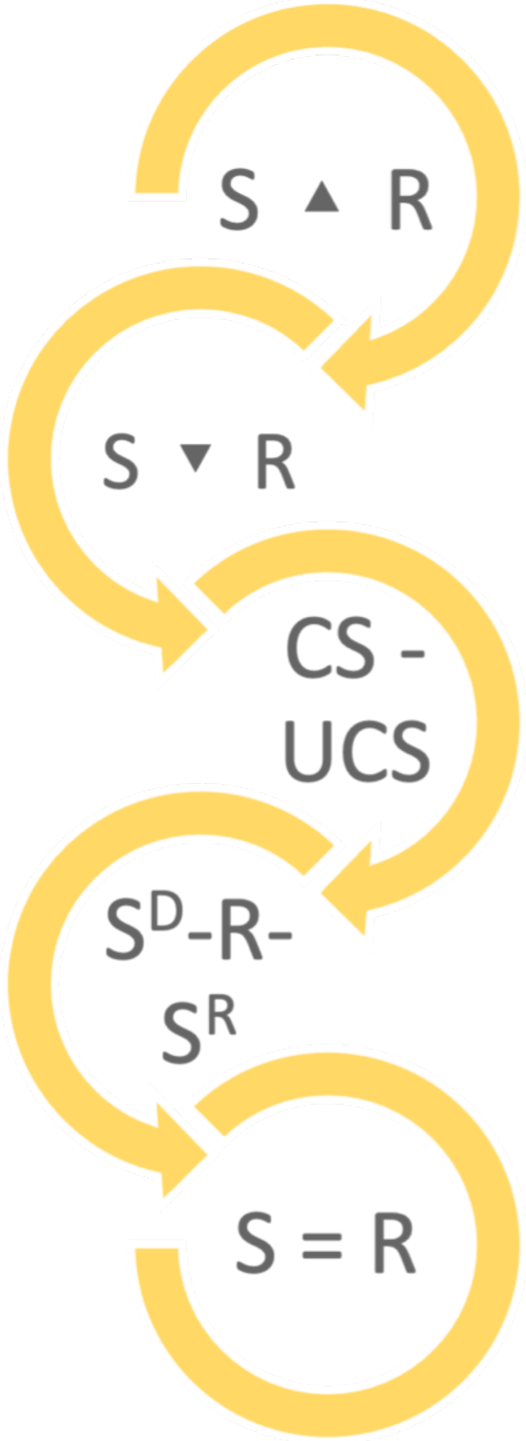
Fysikk

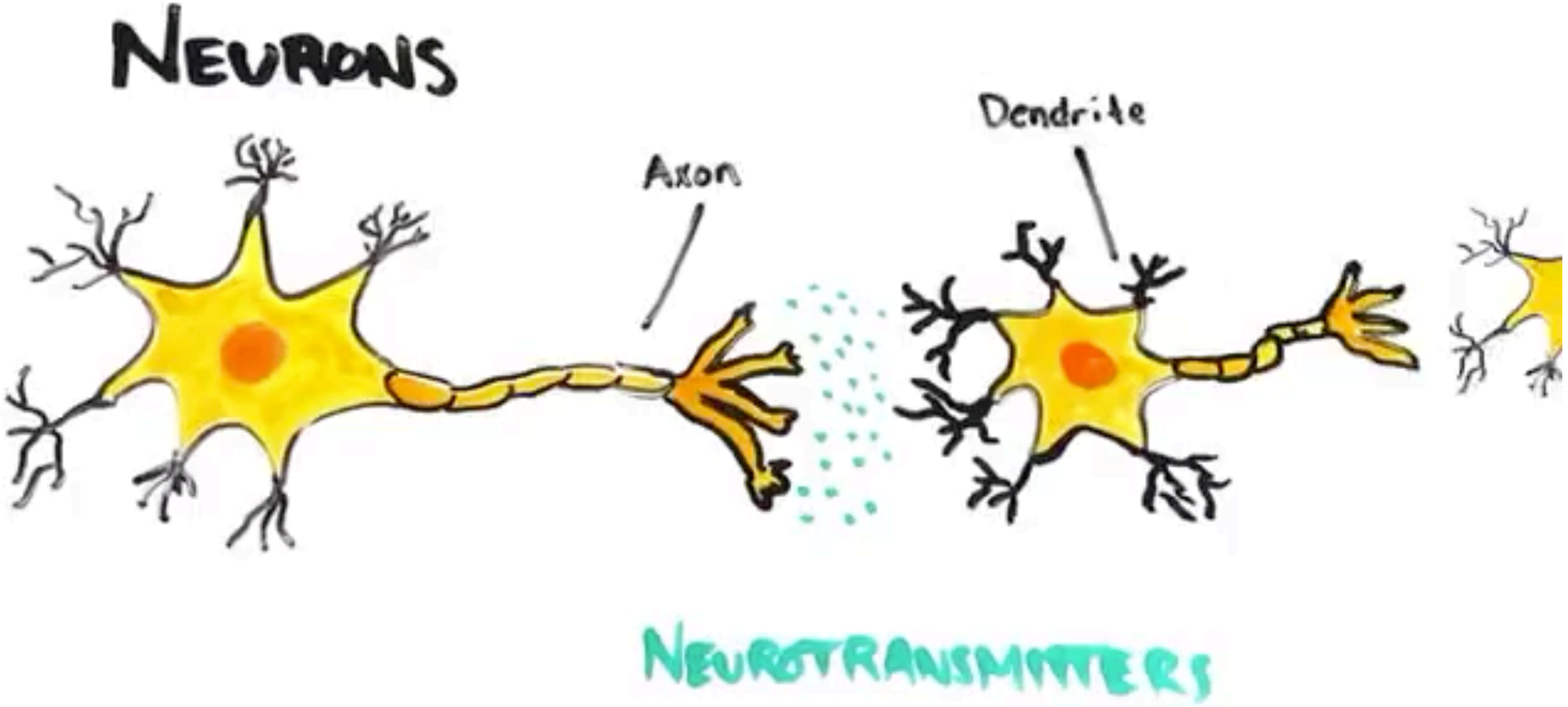


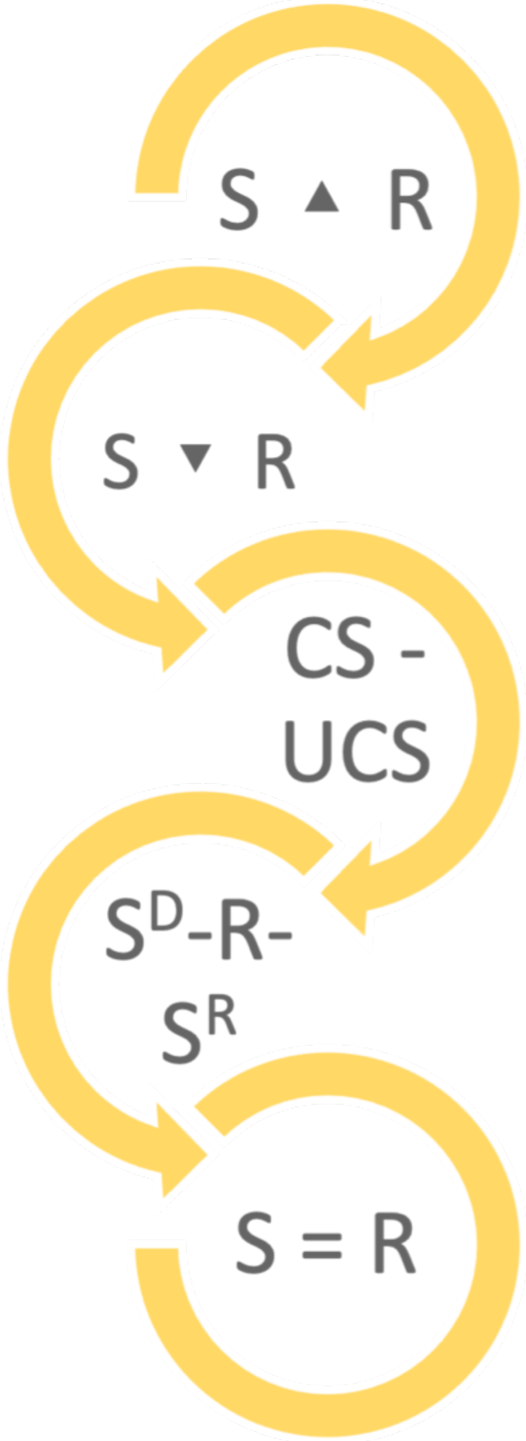
Kjemi

Søren J. Skår, Psykolog og atferdsanalytiker

Hjernen og læring

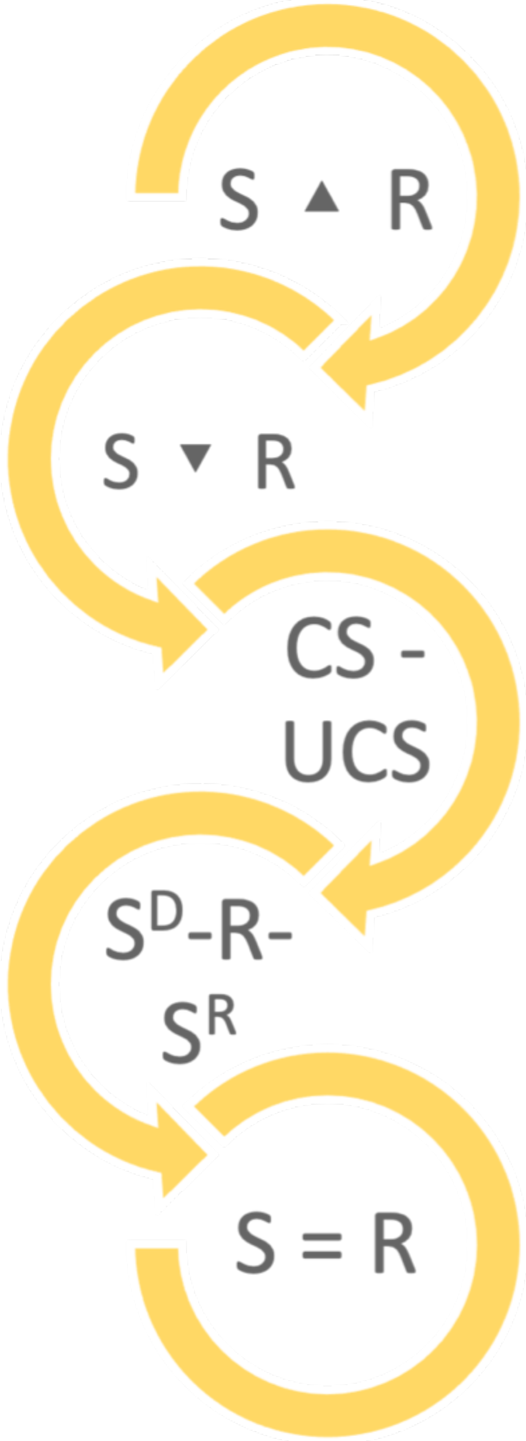


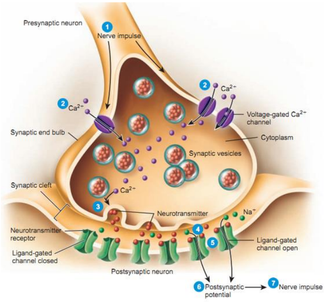




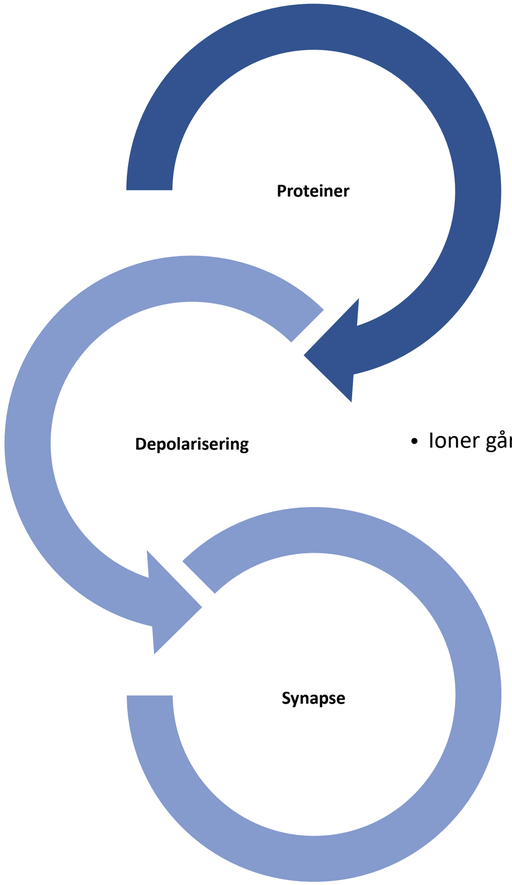
Hjernen og læring

https://www.youtube.com/watch?v=VNNsN9IJkws - Experiences Build Brain Architecture

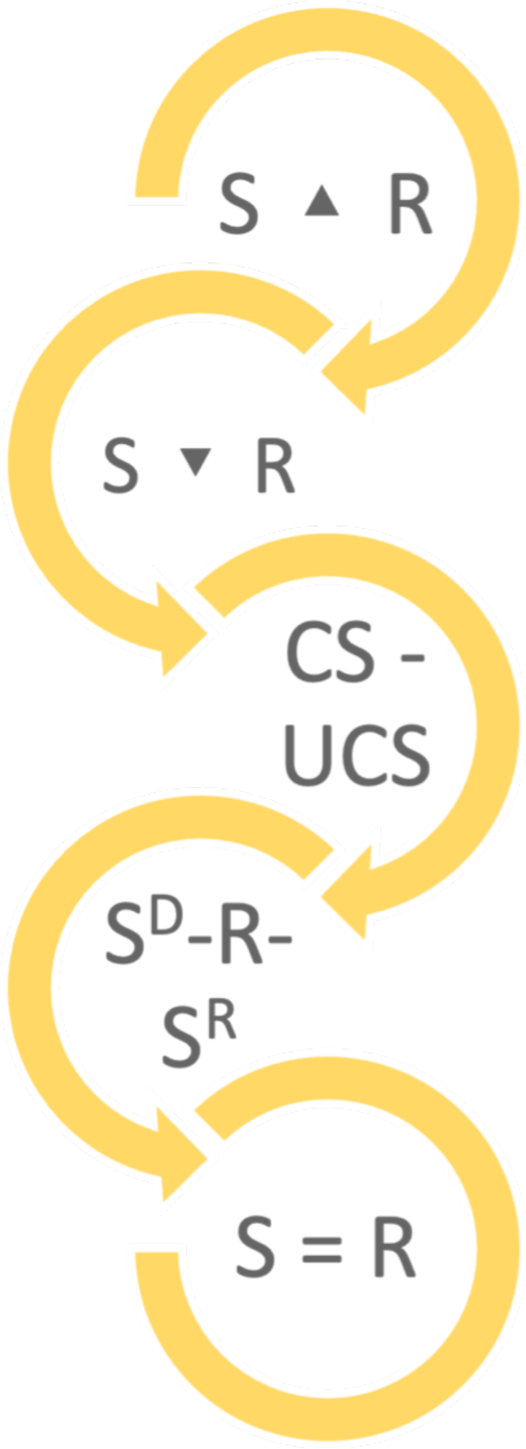




Bilde tatt fra Jelena Mrdalj, fra forelesning i biologisk psykologi ved UiB.



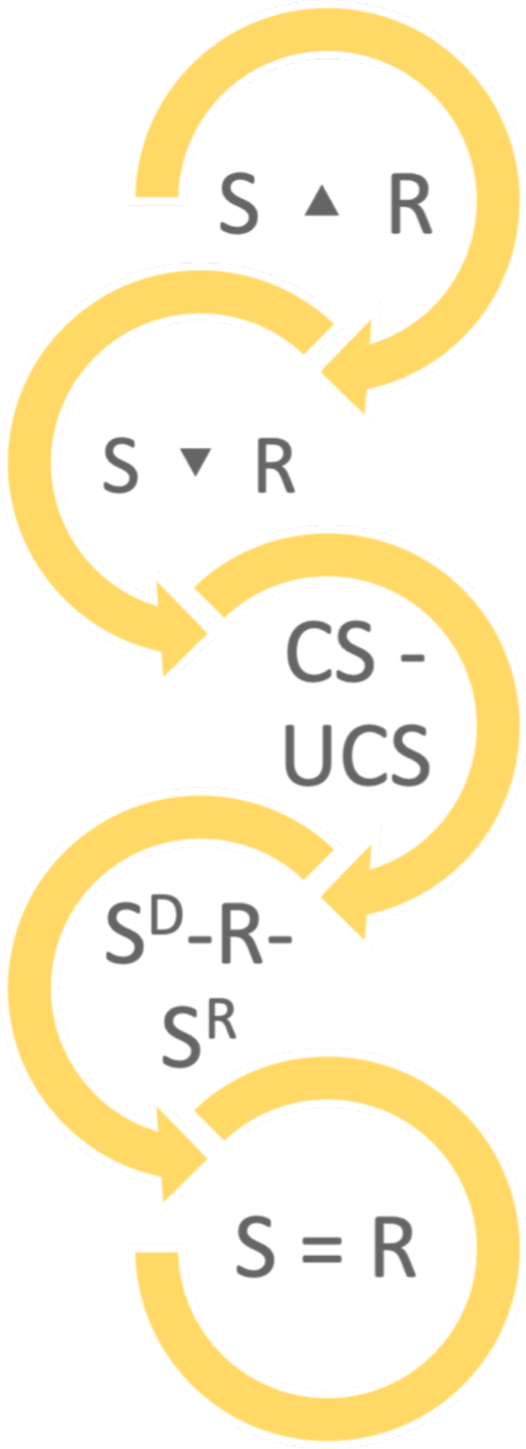
- Sendes nedover aksonet
- Ioner går inn og ut av ulike kanaler
- Stedet hvor informasjon fra et nevron påvirker et annet nevron



Nevroner er en annen del av atferdsligningen

De er ikke hvor atferd kommer fra – dvs. de forårsaker ikke atferd

De opererer ikke uavhengig – dvs. vi har millioner av nevronale kretser involvert i de enkleste læringsmekanismene



Hjernen og læring

Endring i atferd som resultat av erfaringer (Passer & Smith, 2012)

Den fysiske og funksjonelle endringen i hvordan nervesystemet flytter informasjon, som et resultat av stimulering (Brodal, 2017)

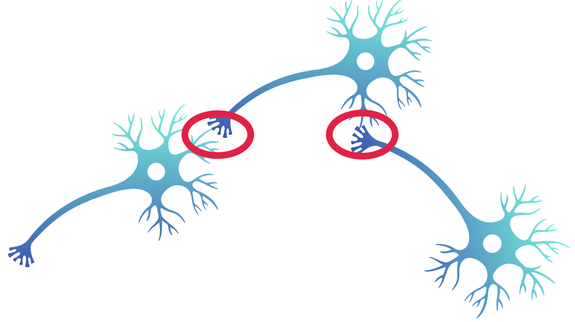
+

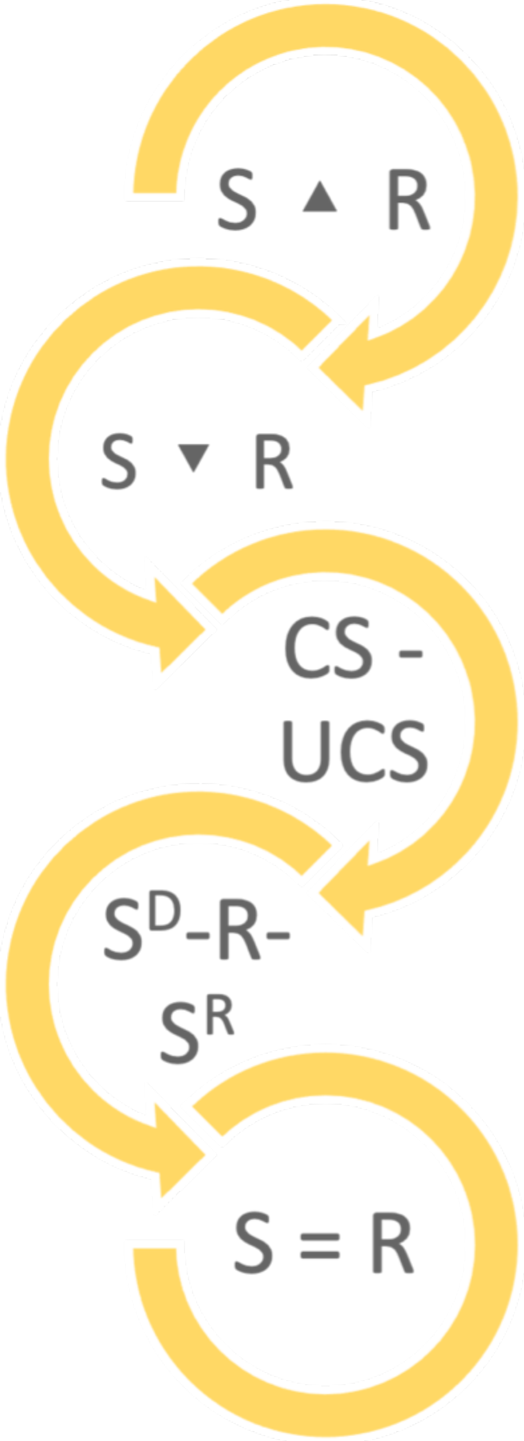
«Antok at det fantes læringsmekanismer som gjaldt for alle organismer» (Passer & Smith, 2011)

↓

- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

Læring

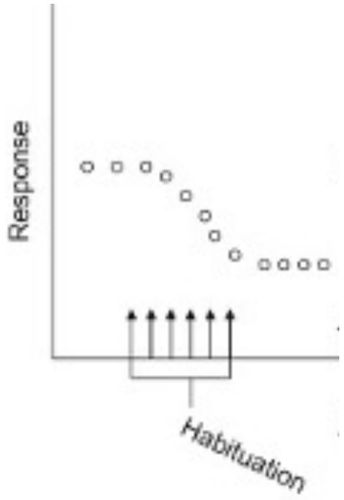




- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

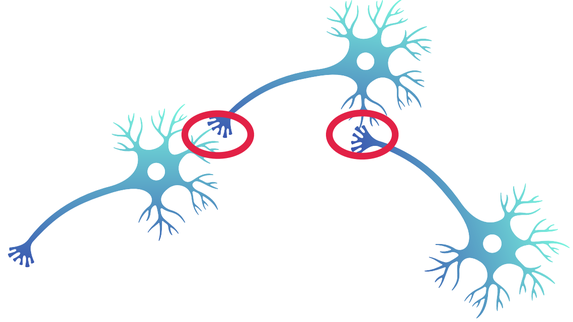
S ↓ R

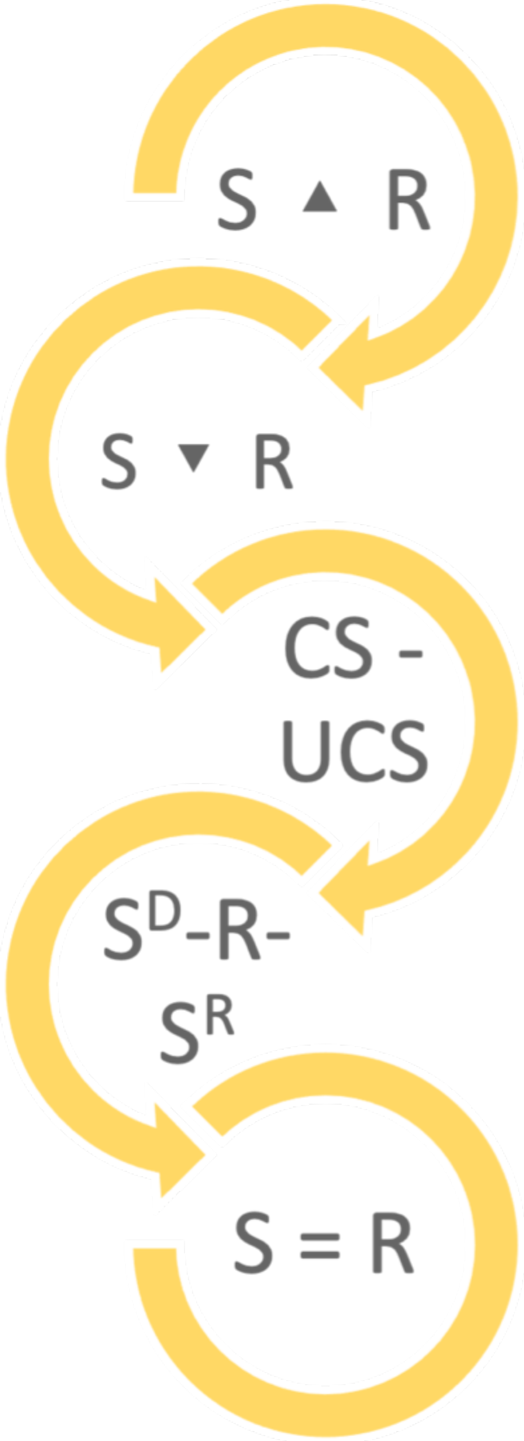
Svekkelse i celles responser til repetert stimulering



Orienteringsrespons

Læring



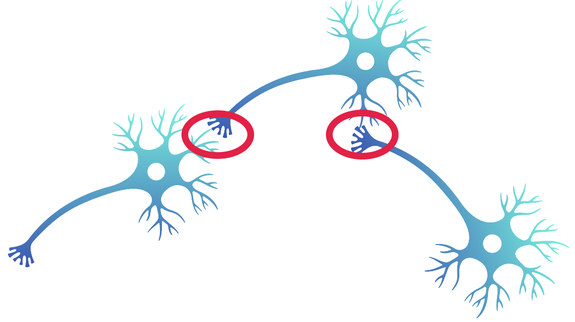


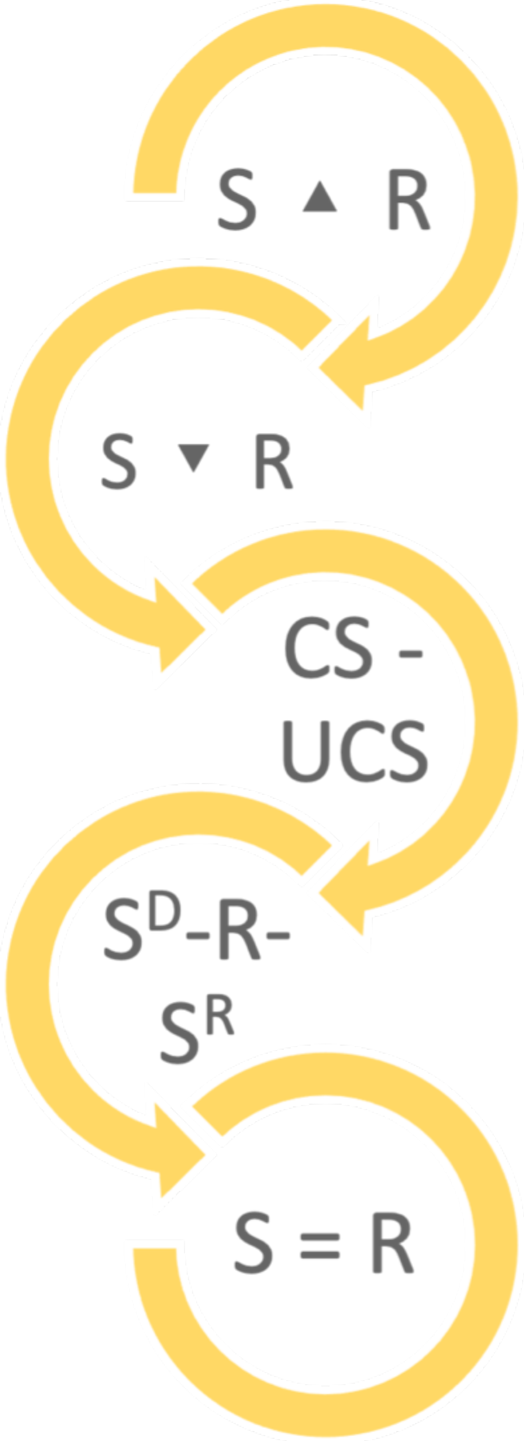
- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

S ↓ R

https://www.youtube.com/watch?v=dlilZh6oqdA&t=33s

Læring

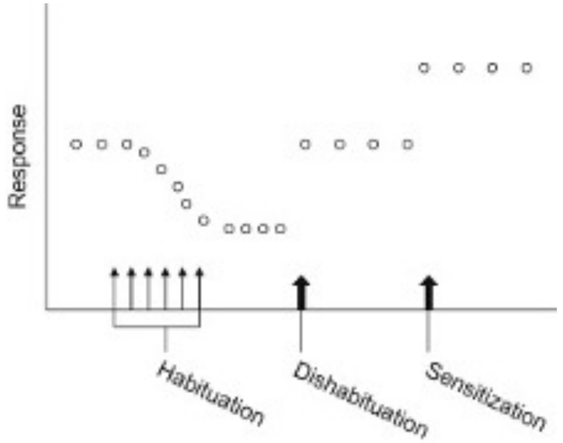


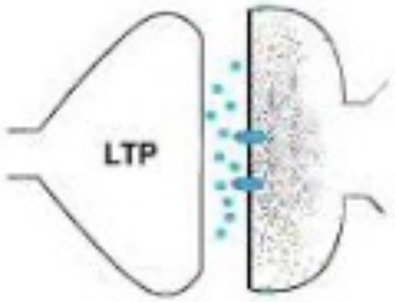


- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

S ▲ R

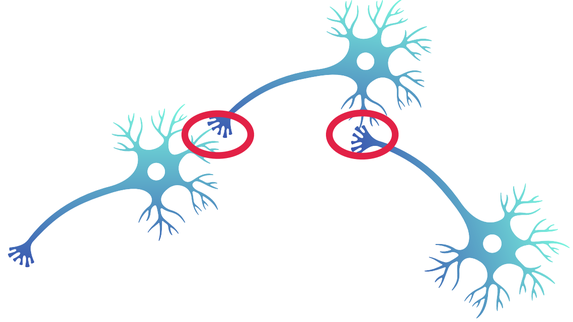
Styrking i celles responser til repetert stimulering

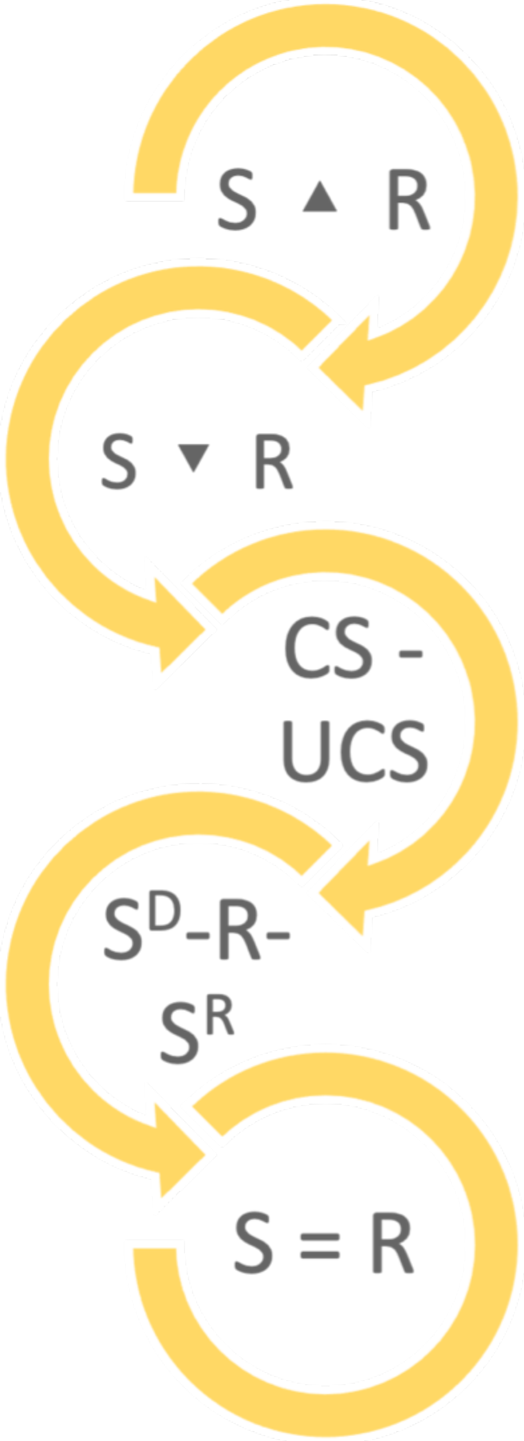




Stress-responser

Læring



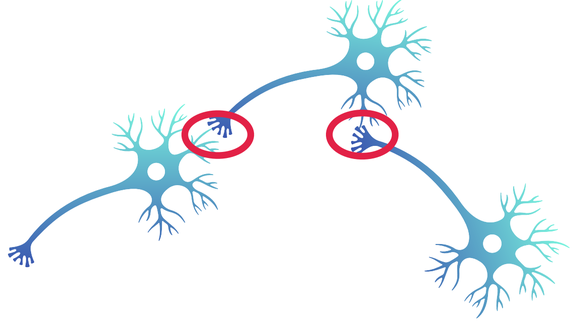


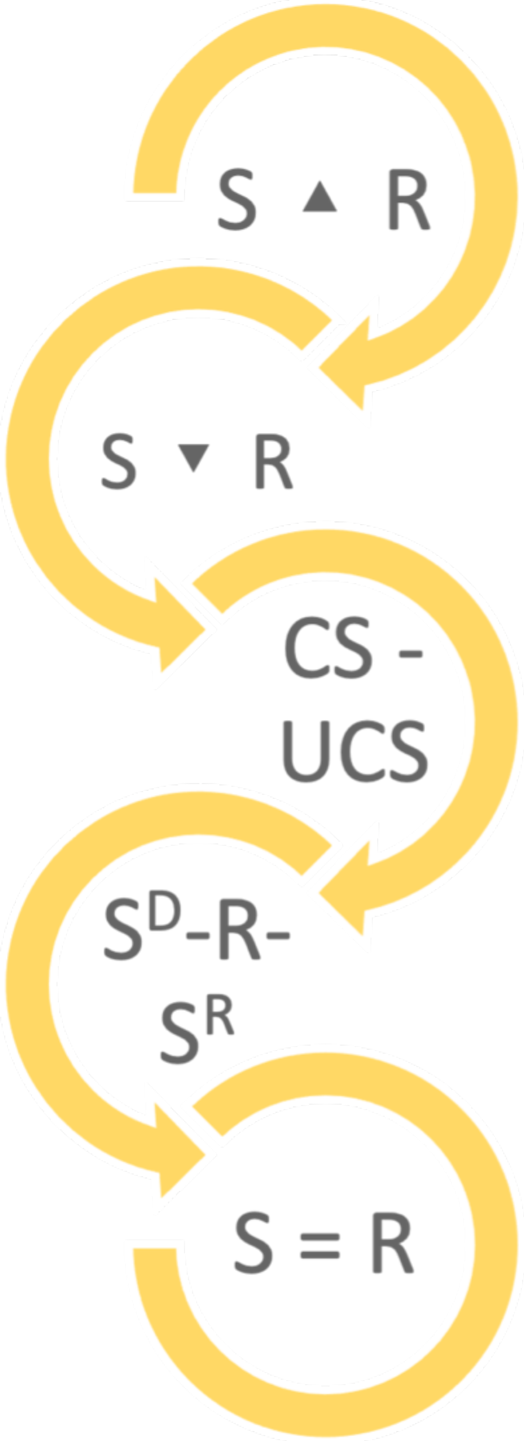
- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

S ▲ R

https://www.youtube.com/watch?v=bmC3-HosS_Q

Læring





- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

CS - UCS - R

Klassisk betinging

Pavloviansk betinging

*Etableres en **assosiasjon** mellom **stimulus** som utløser en naturlig forekommende **refleks**, og en **annen nøytral stimulus***

Reflekser

Angst/fobi

Smak

Emosjoner

Forelskelse

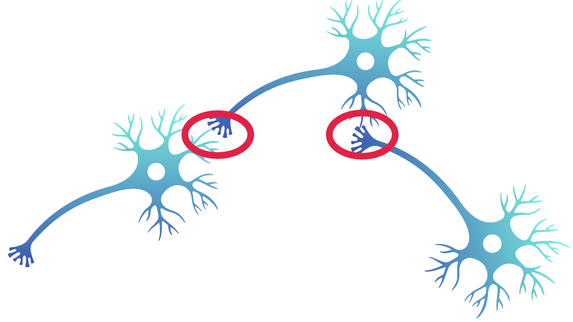
Smerte

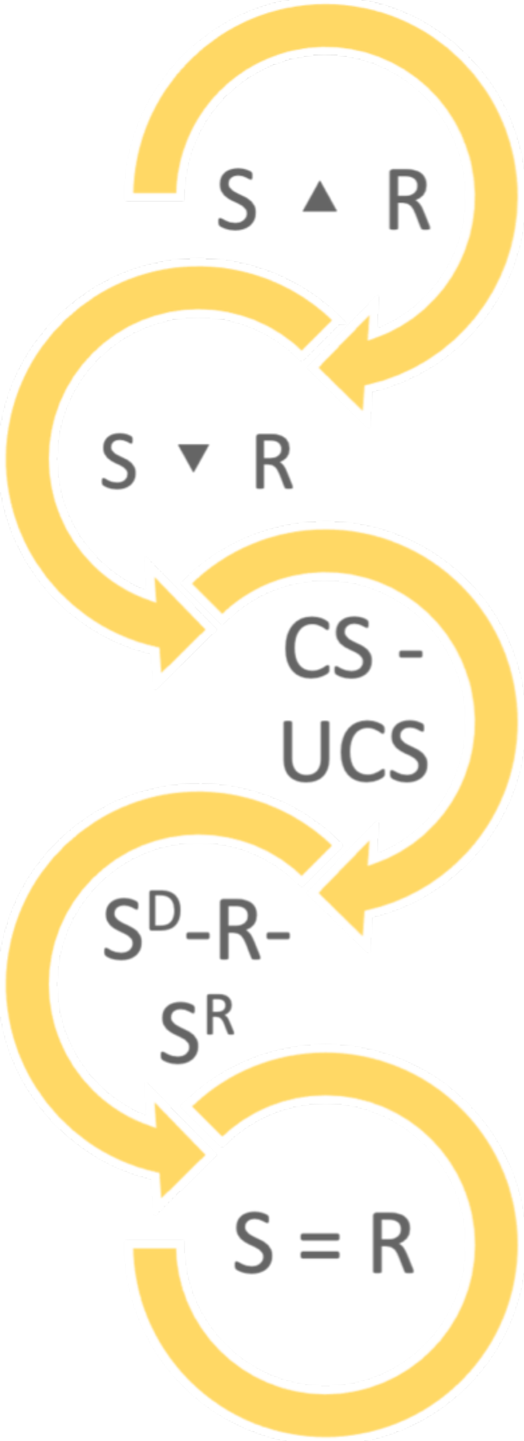
Forskjellig fra sensitivering

Ulike nevrotransmittere

Søren J. Skår, Psykolog og atferdsanalytiker

Læring



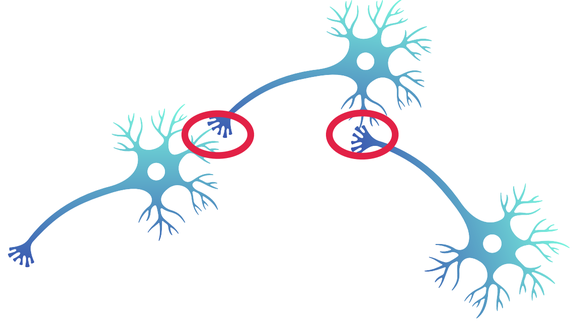


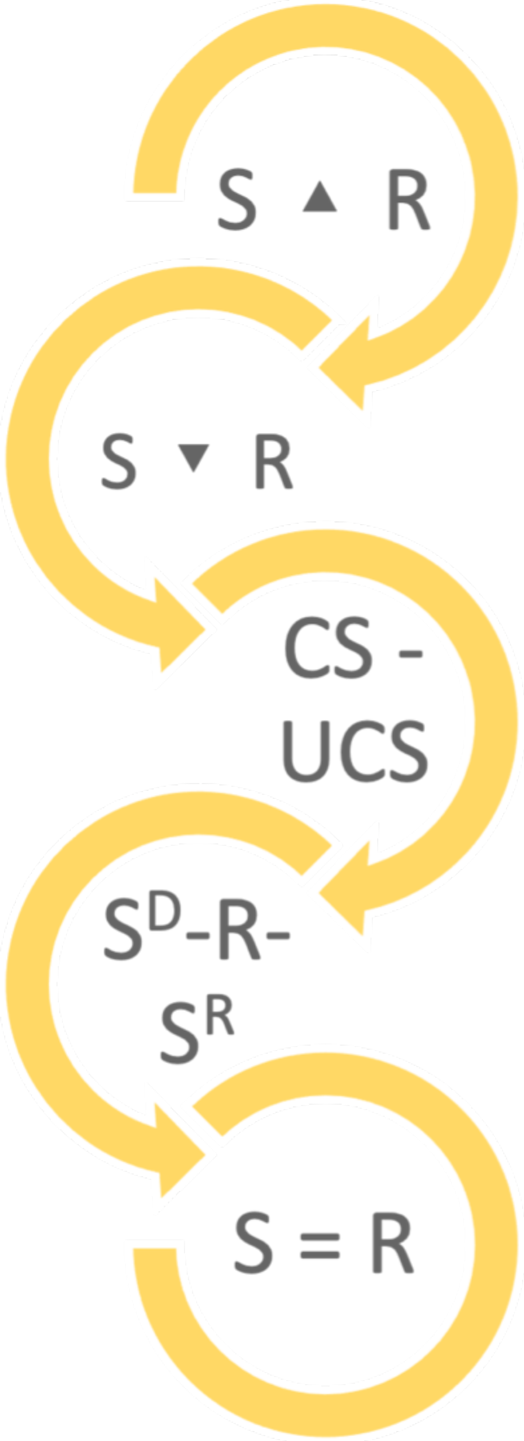
- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

CS - UCS - R

https://www.youtube.com/watch?v=BwnIG3xgaoU

Læring

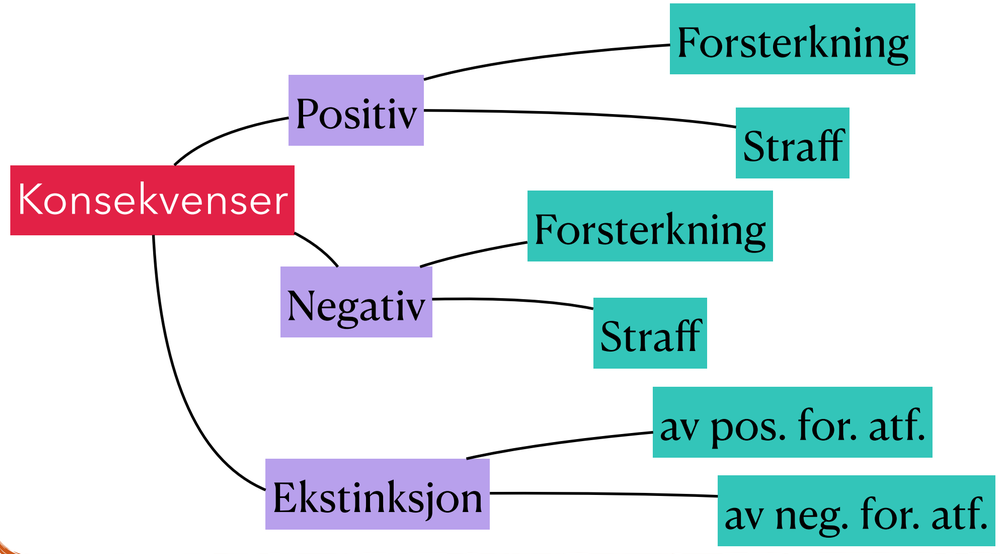




- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

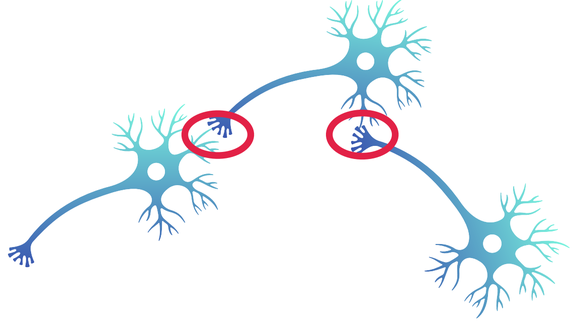
S^D - R - S^C

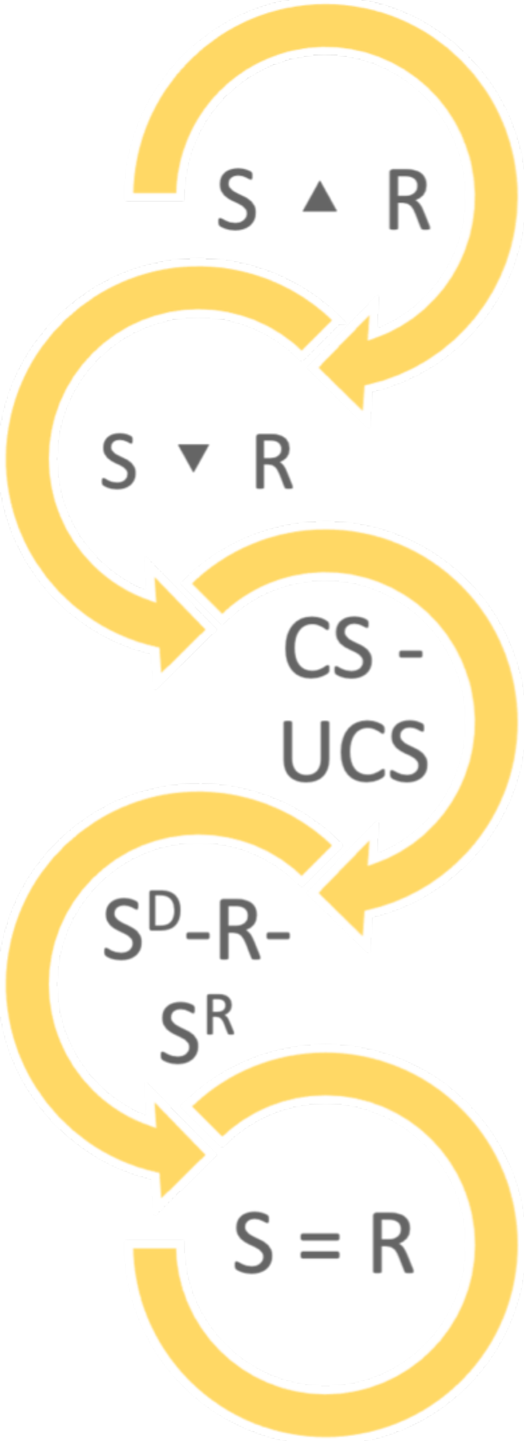
Konsekvenser *som kommer etter responsen,* ***øker*** *eller* ***senker sannsynligheten*** *for at responsen forekommer i* ***samme miljø*** *senere*



Søren J. Skår, Psykolog og atferdsanalytiker

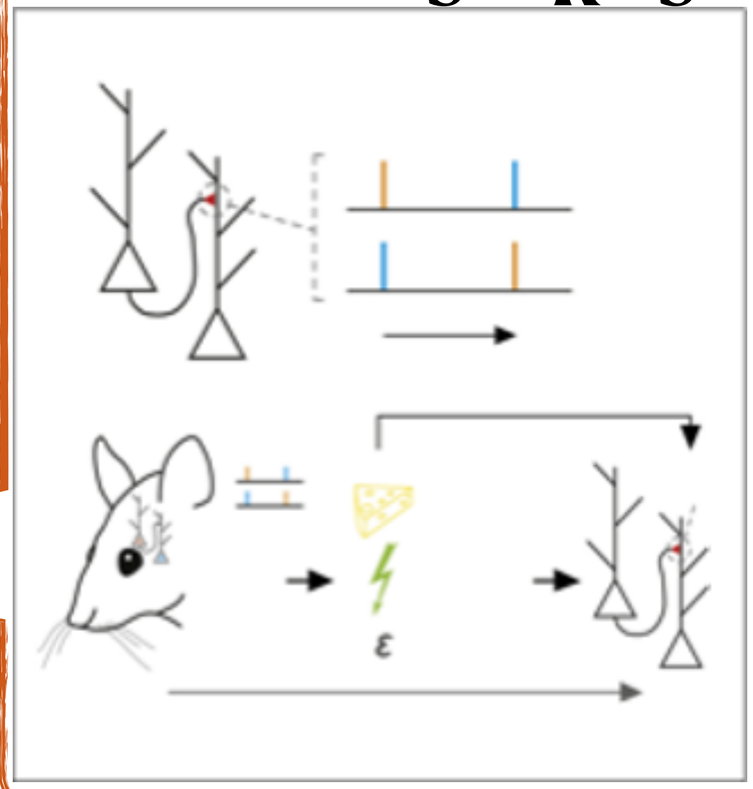
Læring





- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

S^D - R - S^C



Konsekvenser

S^R S^P S^E

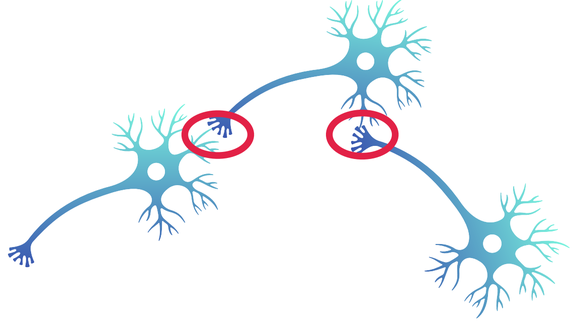
Modulerer

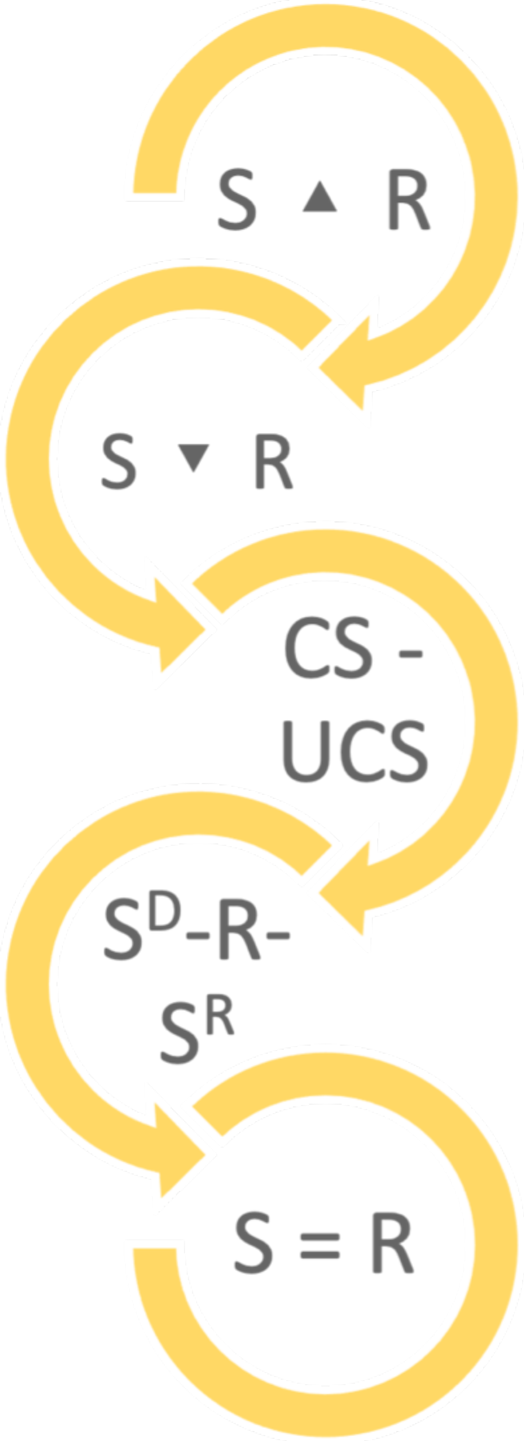
S^D - R

Via

Nevromodulatorer

Læring



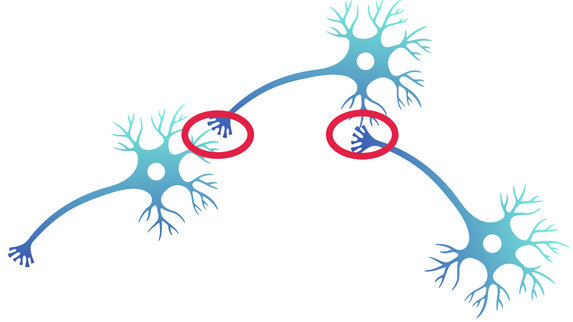


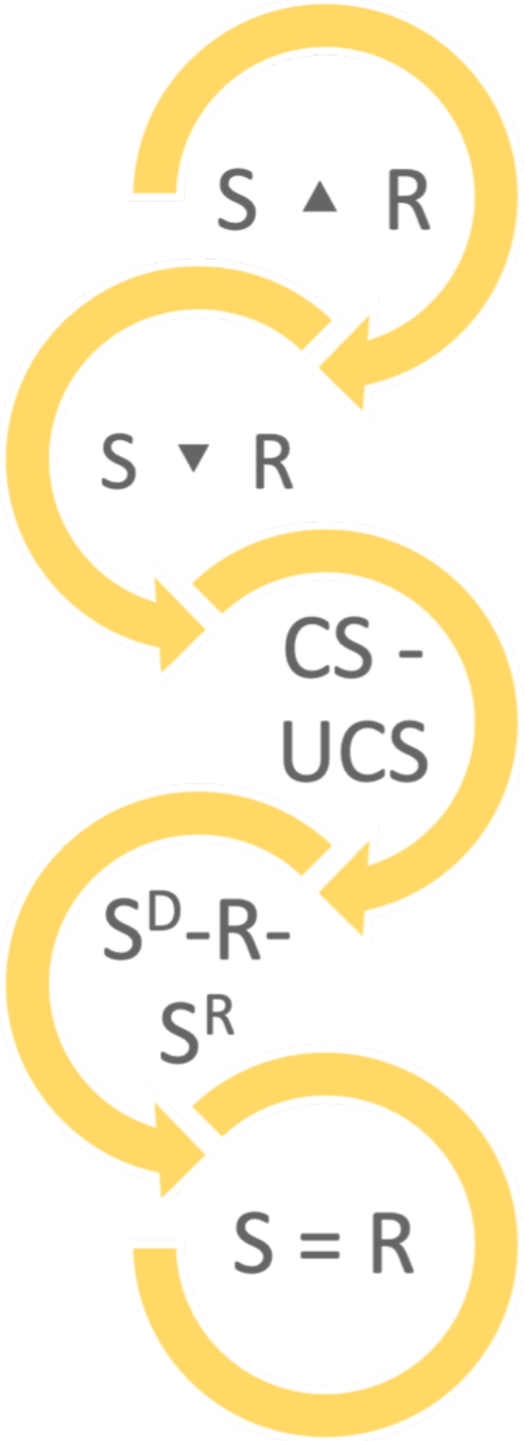
- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

S^D - R - S^C

https://www.youtube.com/watch?v=NeK8GNLylkc

Læring

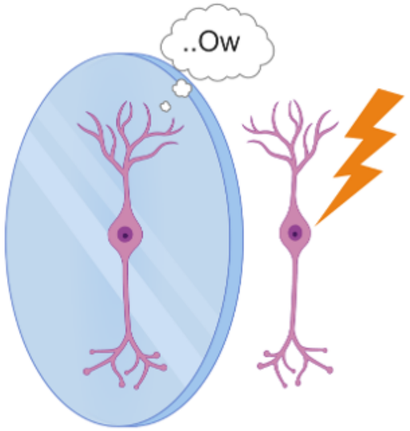




- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

S = R

*Stimuli utløser **spesifikke responser uten tidligere læringshistorie** i individets utvikling*



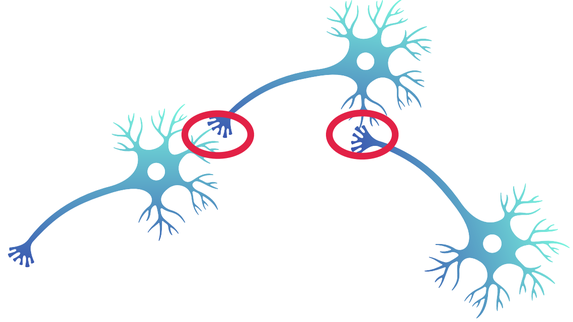
Motoriske responser

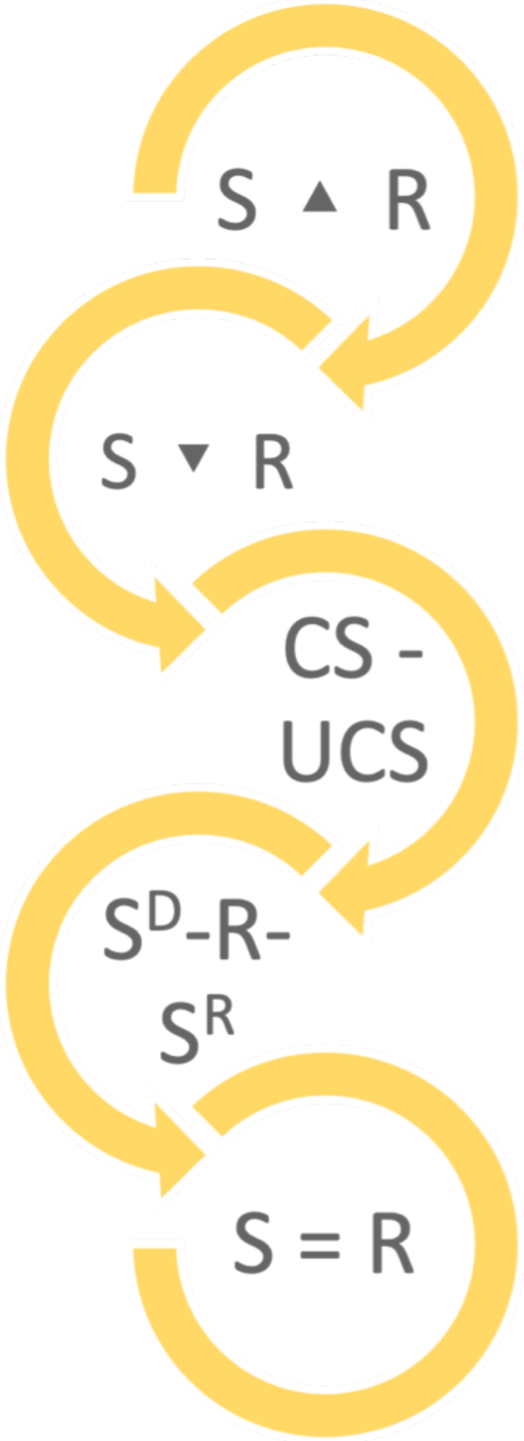
Emosjoner

Persepsjon/sensasjon

Kommunikasjon

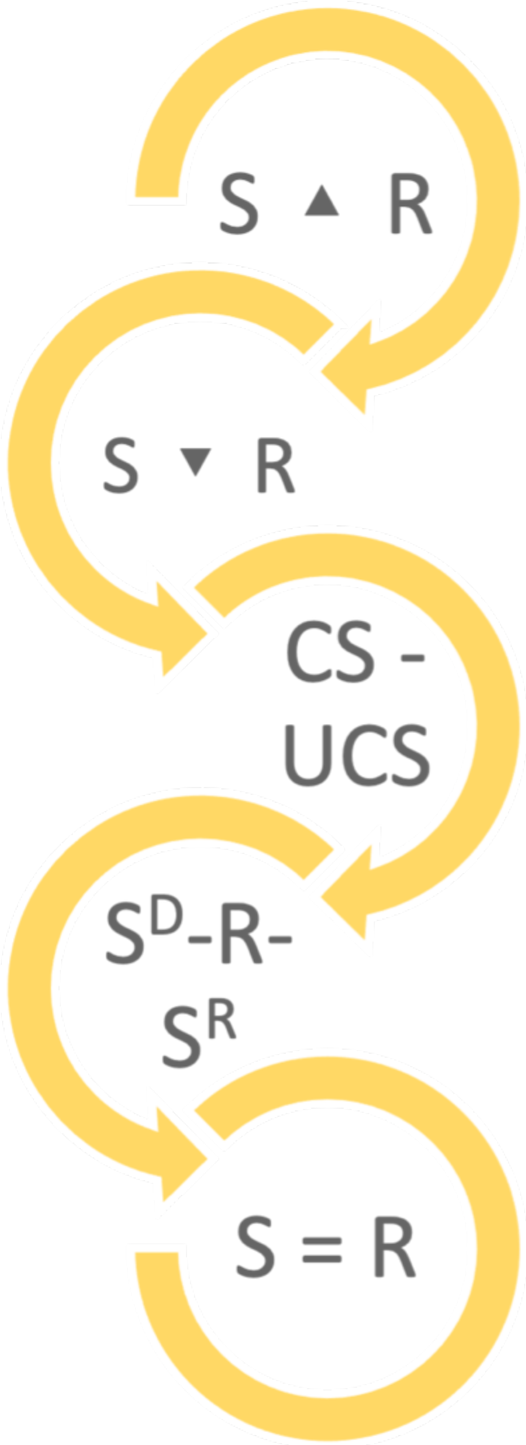
Læring





- Habituering
- Sensitivering
- Respondent betinging
- Operant betinging
- Imitering

S = R



Så - hvorfor gjør vi det vi gjør?

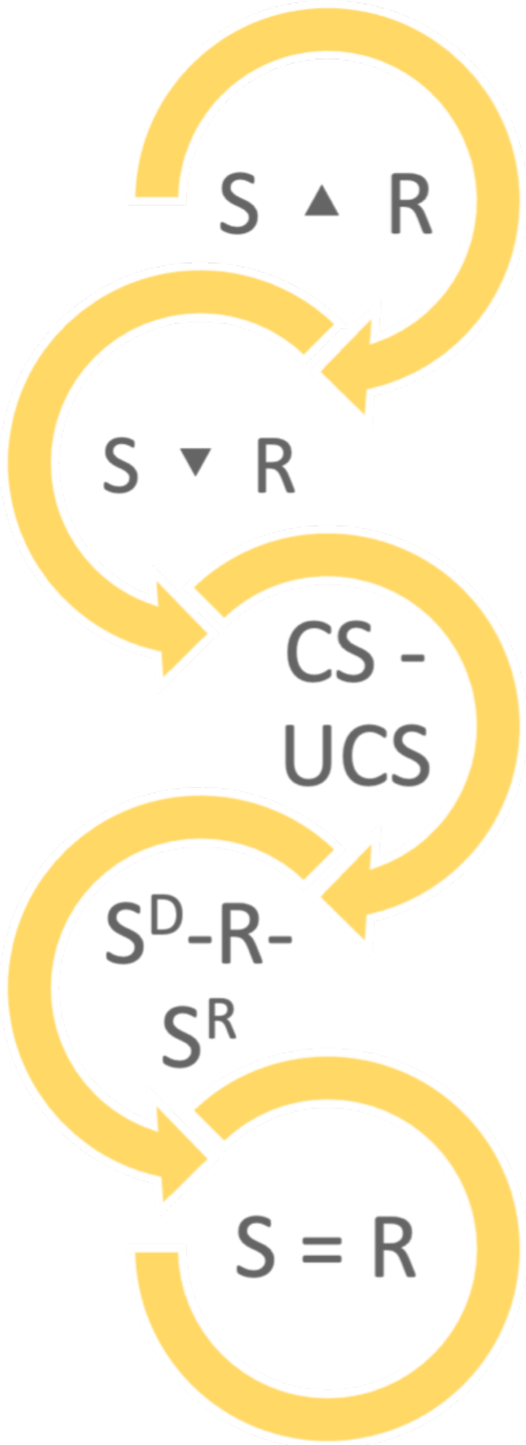
Læring + genetikk + kultur

Vi har vår genetikk

Vi vokser opp i en kultur

Vår «gjøring» (atferd) påvirkes gjennom læring

Søren J. Skår, Psykolog og atferdsanalytiker



Nevrobiologi og atferdsanalyse

Læring er fundamentalt cellulært

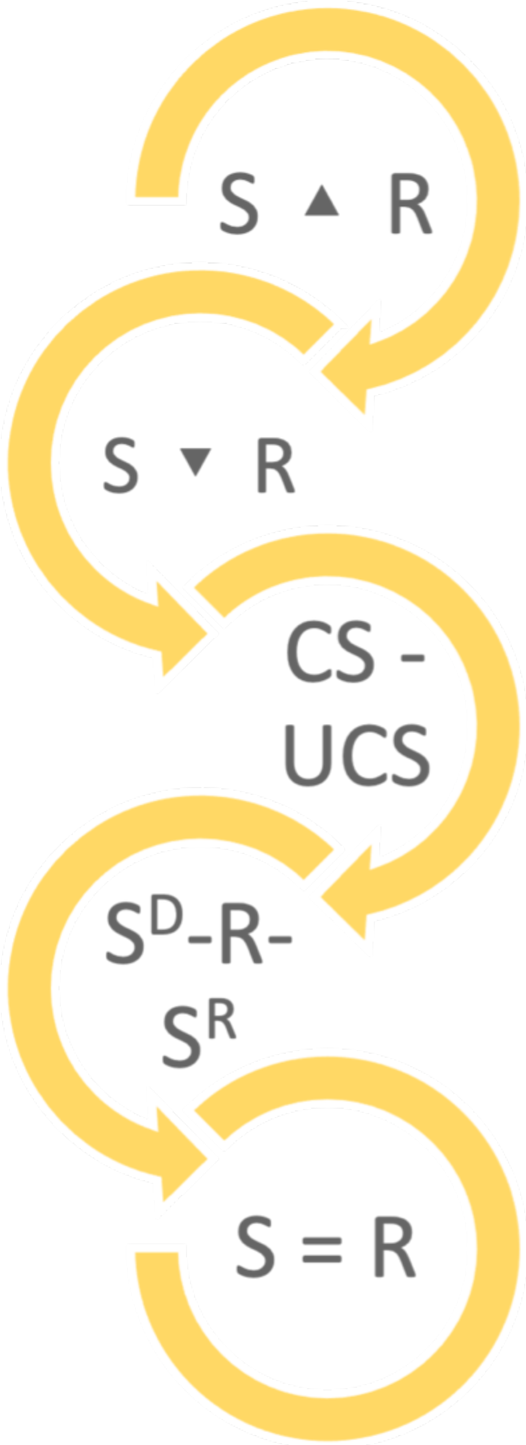
Medfødte forskjeller

Barn og unge som ofte responderer intensivt emosjonelt til stimuli i miljøet

«Reaktive barn»

«Mindre reaktive barn»

Hvem lærer mest effektivt?



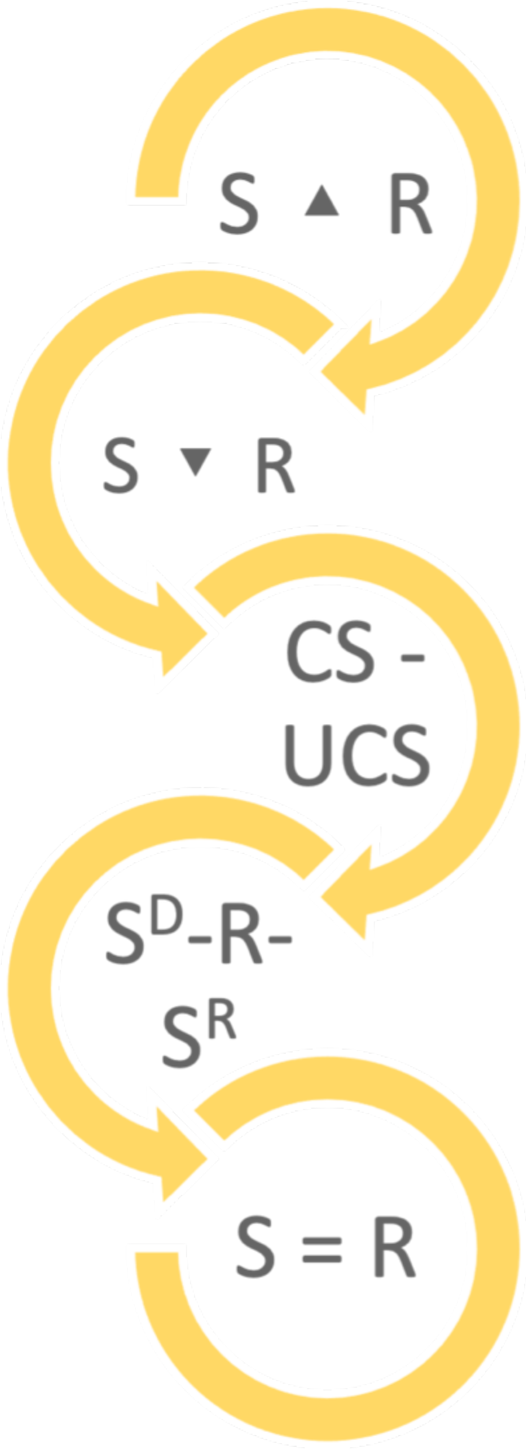
Nevrobiologi og atferdsanalyse

«Reaktive barn»

Temperament → Medfødt forskjell i hvordan organismer reagerer på stimuli fra miljøet og hvordan reaksjonen reguleres

Sammenheng mellom individuelle forskjeller i reaktivitet og læring (Pavlov, 1928)

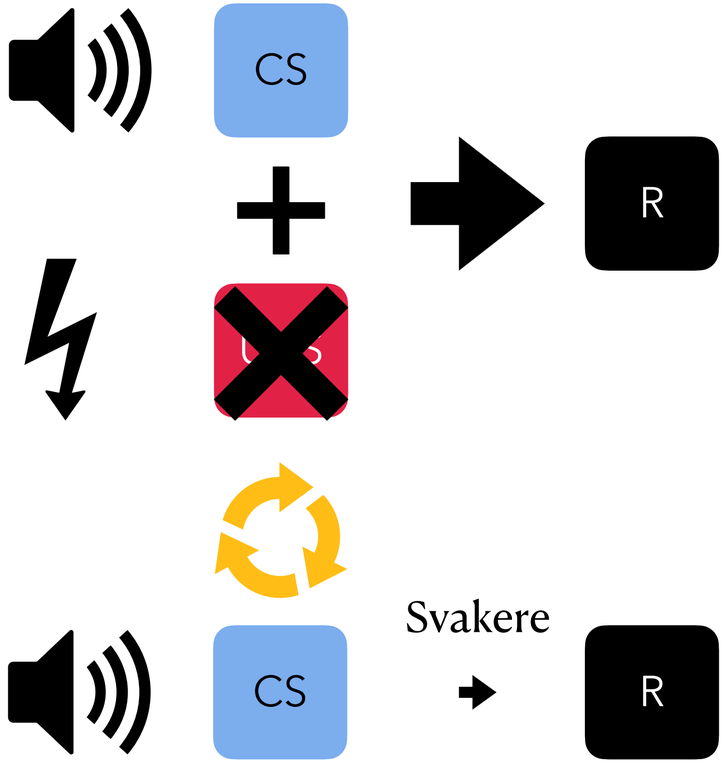
Ser ut til at reaktive organismer lærer «tregere»



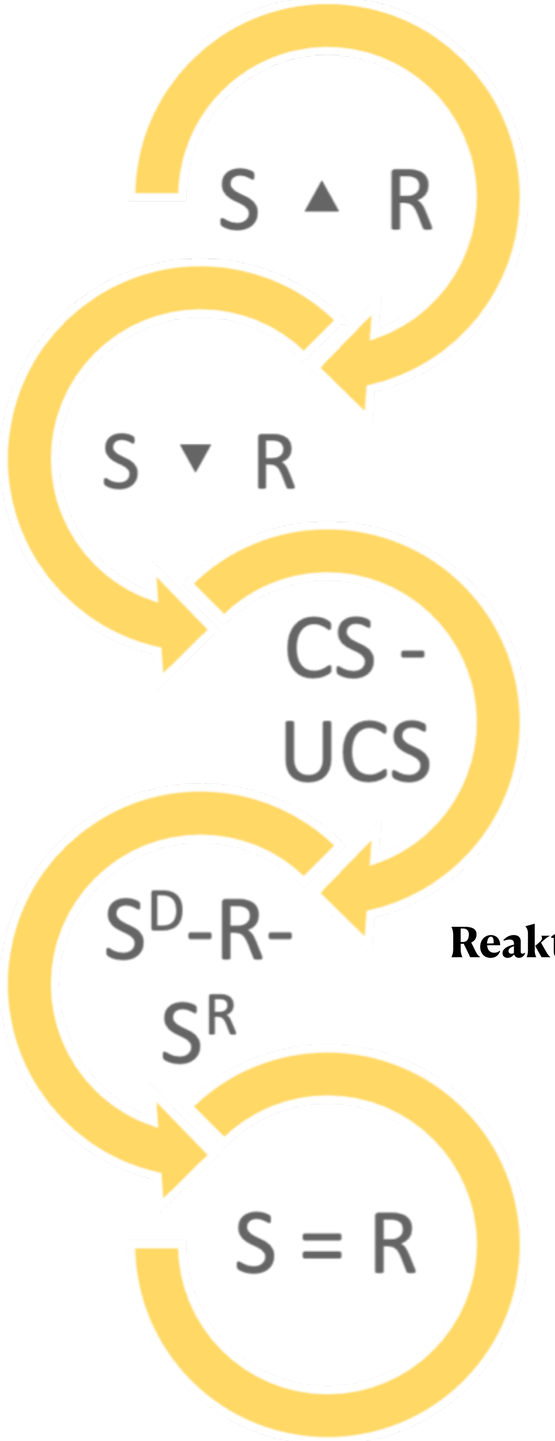
Nevrobiologi og atferdsanalyse

«Reaktive barn»

Respondent ekstinksjon

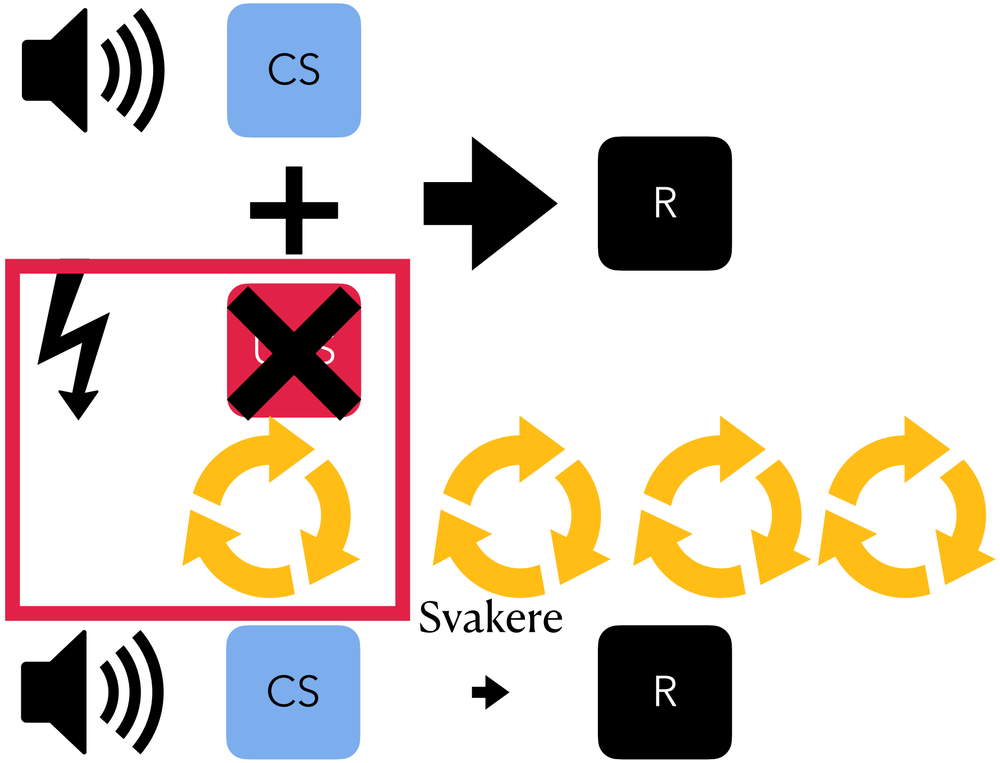


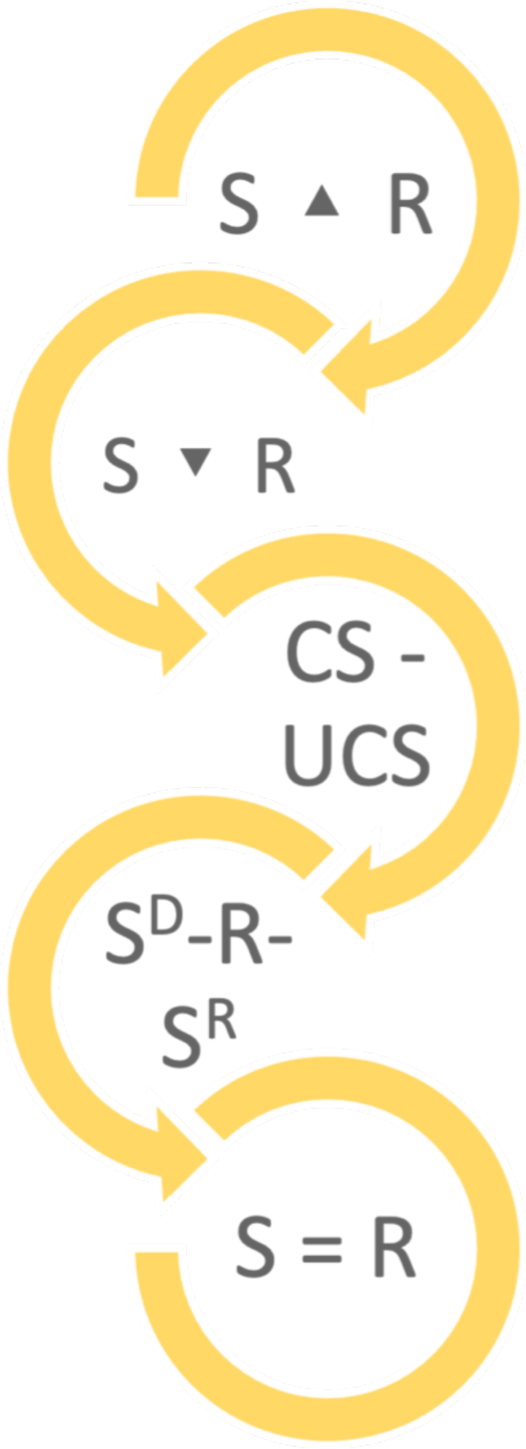
Nevrobiologi og atferdsanalyse



«Reaktive barn»

Reaktivt temperament





Nevrobiologi og atferdsanalyse

«Reaktive barn»

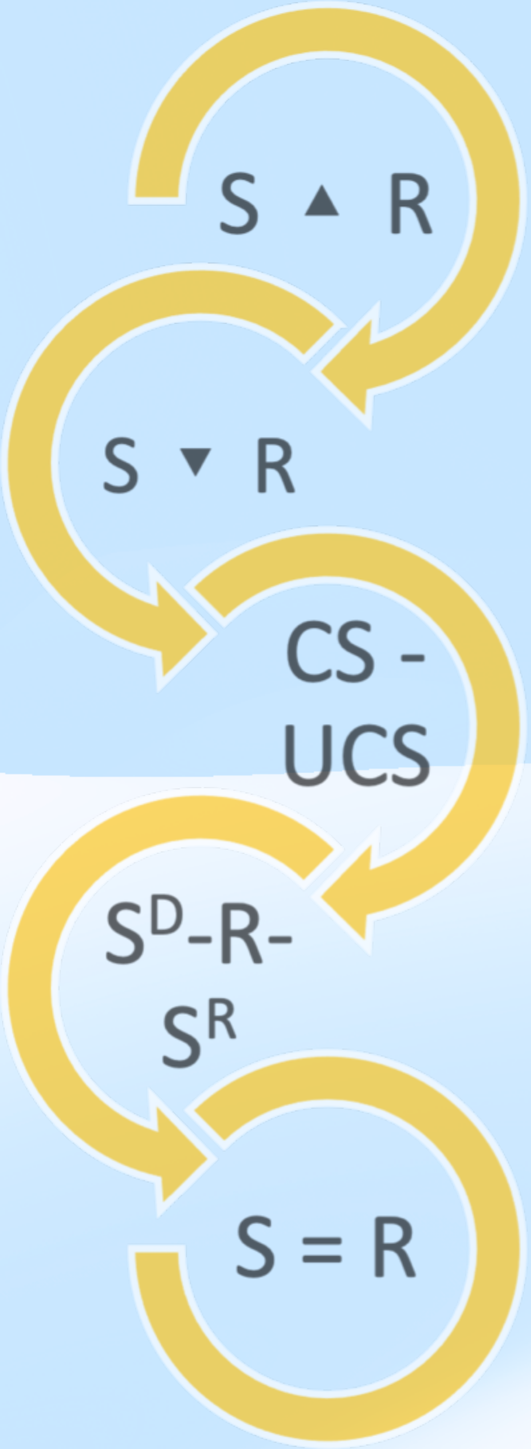
Reaktivt temperament påvirker respondent ekstinksjon

Krever flere gjentakelser

Lettere spontant tilbakefall

Andre faktorer som påvirker respondent ekstinksjon

Alder **Kjønn**



Atferdsanalyse

+

Nevrobiologi

=

SANT ❤️

Behaviorology