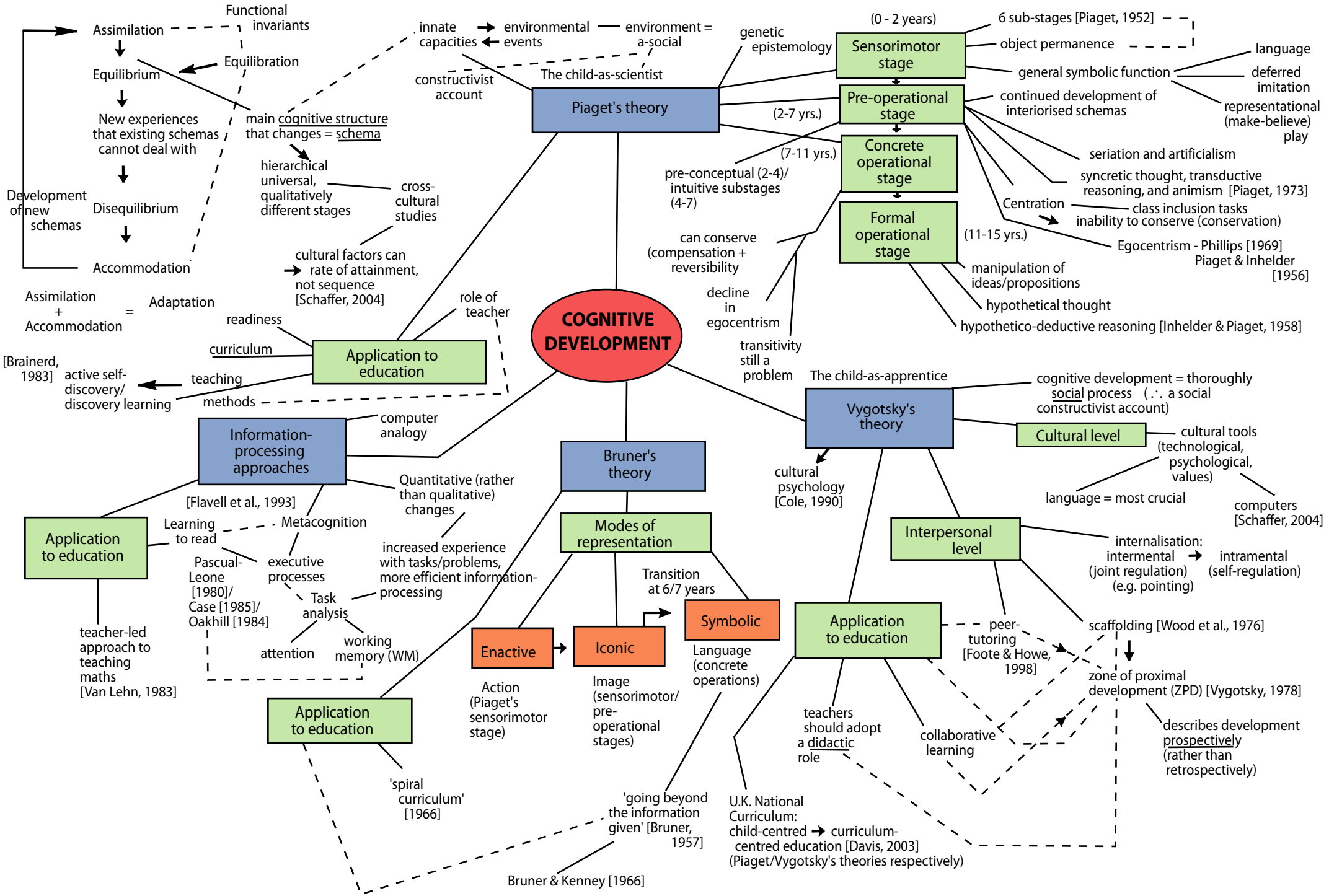
COGNITIVE DEVELOPMENT
Piaget's theory
The child-as-scientist
constructivist account
innate capacities
environmental events
environment = a-social
genetic epistemology
Sensorimotor stage
(0 - 2 years)
6 sub-stages [Piaget, 1952]
object permanence
general symbolic function
language
deferred imitation
representational (make-believe) play
Pre-operational stage
(2-7 yrs.)
continued development of interiorised schemas
seriation and artificialism
syncretic thought, transductive reasoning, and animism [Piaget, 1973]
Centration
class inclusion tasks
inability to conserve (conservation)
Egocentrism - Phillips [1969]
Piaget & Inhelder [1956]
Concrete operational stage
(7-11 yrs.)
pre-conceptual (2-4)/ intuitive substages (4-7)
can conserve (compensation + reversibility
decline in egocentrism
transitivity still a problem
Formal operational stage
(11-15 yrs.)
manipulation of ideas/propositions
hypothetical thought
hypothetico-deductive reasoning [Inhelder & Piaget, 1958]
Assimilation
Functional invariants
Equilibration
Equilibrium
New experiences that existing schemas cannot deal with
Disequilibrium
Accommodation
Development of new schemas
main cognitive structure that changes = schema
hierarchical universal, qualitatively different stages
cross-cultural studies
cultural factors can rate of attainment, not sequence [Schaffer, 2004]
Assimilation + Accommodation = Adaptation
Application to education
readiness
curriculum
teaching
methods
role of teacher
[Brainerd, 1983]
active self-discovery/ discovery learning
Information-processing approaches
computer analogy
Quantitative (rather than qualitative) changes
[Flavell et al., 1993]
Metacognition
executive processes
Task analysis
attention
working memory (WM)
Pascual-Leone [1980]/ Case [1985]/ Oakhill [1984]
increased experience with tasks/problems, more efficient information-processing
Application to education
Learning to read
teacher-led approach to teaching maths [Van Lehn, 1983]
Bruner's theory
Modes of representation
Transition at 6/7 years
Enactive
Iconic
Symbolic
Action (Piaget's sensorimotor stage)
Image (sensorimotor/ pre-operational stages)
Language (concrete operations)
Application to education
'spiral curriculum' [1966]
'going beyond the information given' [Bruner, 1957]
Bruner & Kenney [1966]
Vygotsky's theory
The child-as-apprentice
cognitive development = thoroughly social process (∴ a social constructivist account)
Cultural level
cultural tools (technological, psychological, values)
language = most crucial
computers [Schaffer, 2004]
cultural psychology [Cole, 1990]
Interpersonal level
internalisation: intermental (joint regulation) (e.g. pointing) → intramental (self-regulation)
peer-tutoring [Foote & Howe, 1998]
scaffolding [Wood et al., 1976]
zone of proximal development (ZPD) [Vygotsky, 1978]
describes development prospectively (rather than retrospectively)
Application to education
teachers should adopt a didactic role
collaborative learning
U.K. National Curriculum: child-centred → curriculum-centred education [Davis, 2003] (Piaget/Vygotsky's theories respectively)