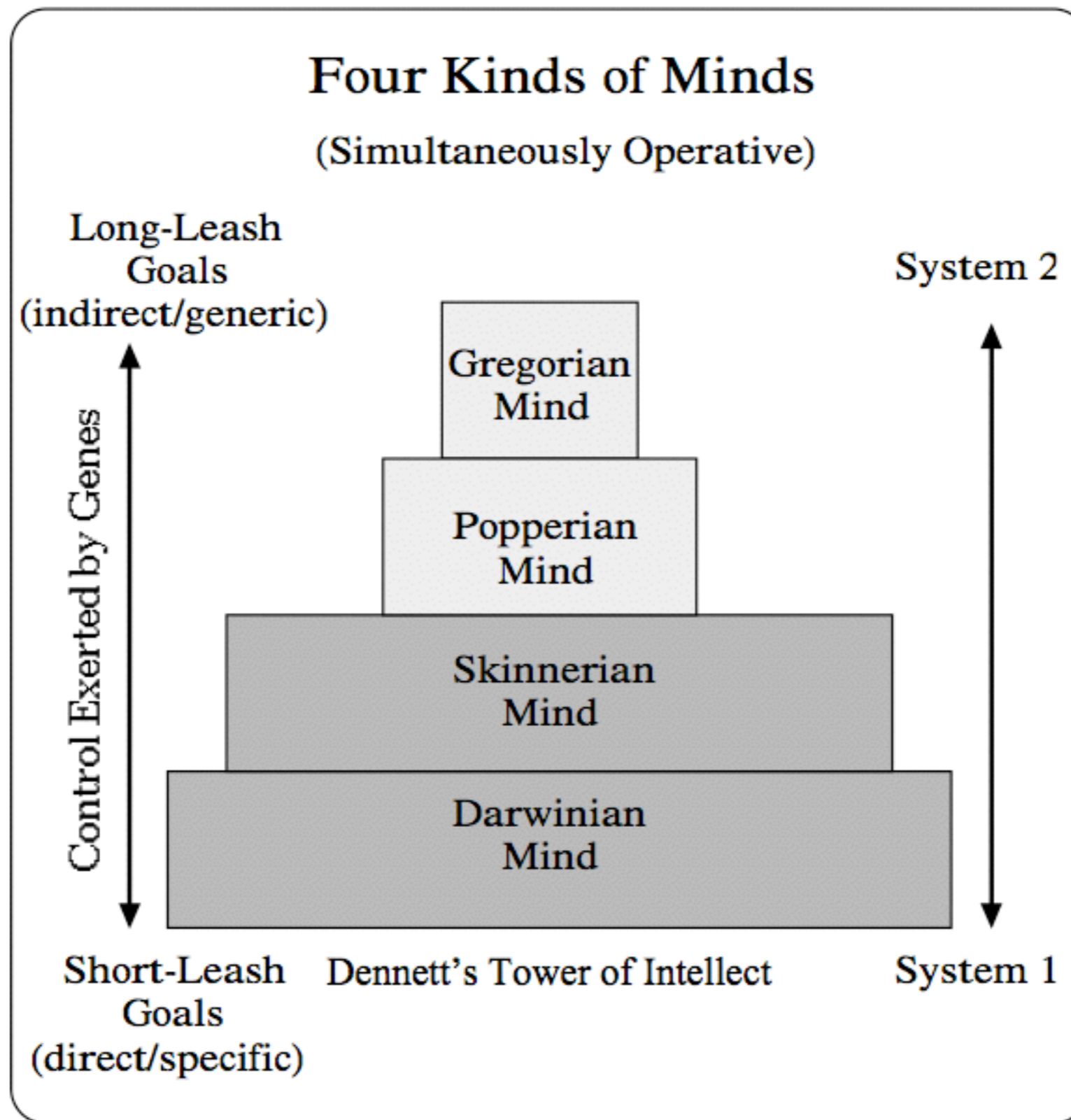


**“One of the first rules of science is if somebody delivers a secret weapon to you, you better use it.”**

***—Herbert Simon***

# **Q1: How the Mind Works**



**Dennett, D. C. (1996). Kinds of Minds: Towards an Understanding of Consciousness (Science Masters S.).**



Table 3. *The terms for the two systems used by a variety of theorists and the properties of dual-process theories of reasoning*

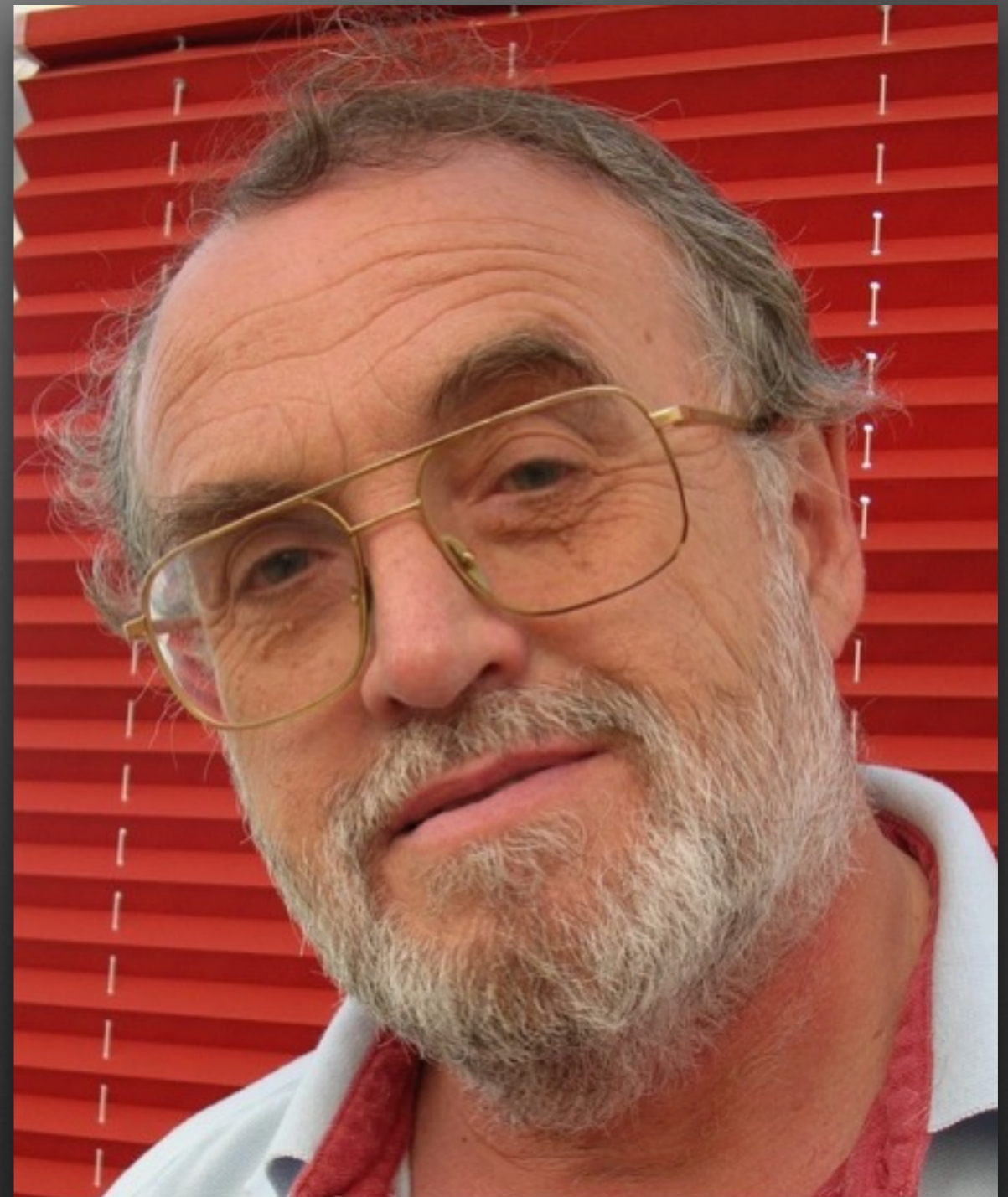
	System 1	System 2
<b>Dual-Process Theories:</b>		
Slovic (1996)	associative system	rule-based system
Evans (1984;1989)	heuristic processing	analytic processing
Evans & Over (1996)	tacit thought processes	explicit thought processes
Reber (1993)	implicit cognition	explicit learning
Levinson (1995)	interactional intelligence	analytic intelligence
Epstein (1994)	experiential system	rational system
Pollock (1991)	quick and inflexible modules	intellection
Hammond (1996)	intuitive cognition	analytical cognition
Klein (1998)	recognition-primed decisions	rational choice strategy
Johnson-Laird (1983)	implicit inferences	explicit inferences
Shiffrin & Schneider (1977)	automatic processing	controlled processing
Posner & Snyder (1975)	automatic activation	conscious processing system
<b>Properties:</b>		
	associative	rule-based
	holistic	analytic
	automatic	controlled
	relatively undemanding of cognitive capacity	demanding of cognitive capacity
	relatively fast	relatively slow
	acquisition by biology, exposure, and personal experience	acquisition by cultural and formal tuition
<b>Task Construal</b>	highly contextualized personalized conversational and socialized	decontextualized depersonalized asocial
<b>Type of Intelligence</b>	interactional	analytic (psychometric IQ)
Indexed:	(conversational implicature)	

**Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate?**



# Evans

- Evans, J. S. B., Barston, J. L., & Pollard, P. (1983). On the conflict between logic and belief in syllogistic reasoning. *Memory & cognition*, 11(3), 295-306.
- Evans, J. S. B. (1989). *Bias in human reasoning: Causes and consequences*. Lawrence Erlbaum Associates, Inc.
- Evans, J. S. B. (2003). In two minds: dual-process accounts of reasoning. *Trends in cognitive sciences*, 7(10), 454-459.
- Evans, J. S. B., & Frankish, K. E. (2009). *In two minds: Dual processes and beyond*. Oxford University Press.





# Kahneman

Kahneman, D. (2011). Thinking, fast and slow. Macmillan.



**Table 2.** A Glossary of Dual-Process Terminologies Used in This Article

Term	Definition
Dual processes	The assumption by many theorists that cognitive tasks evoke two forms of processing that contribute to observed behavior. Unless otherwise indicated, the term refers in this article to dual-type theories.
Dual types	Terminology that implies that the dual processes are qualitatively distinct. Type 1 processes are (broadly) intuitive and Type 2 processes reflective (see Table 1).
Dual systems	It is common in the literature to use the terms <i>System 1</i> and <i>System 2</i> to refer to the Type 1 and 2 distinction. Some but not all authors associate these with an evolutionary distinction. The current authors now prefer to avoid this terminology as it suggests (falsely) that the two types of processes are located in just two specific cognitive or neurological systems.
Modes of processing	Modes of processing are forms of Type 2 thinking that may differ on a continuum. Individual differences on such continua are often assessed with thinking-disposition measures.
The autonomous set of systems (TASS)	The proposal that there are multiple Type 1 systems of different kinds, including modular, habitual, and automated forms of processing.

Evans, J. S. B., & Stanovich, K. E. (2013). Dual-process theories of higher cognition advancing the debate. *Perspectives on Psychological Science*,



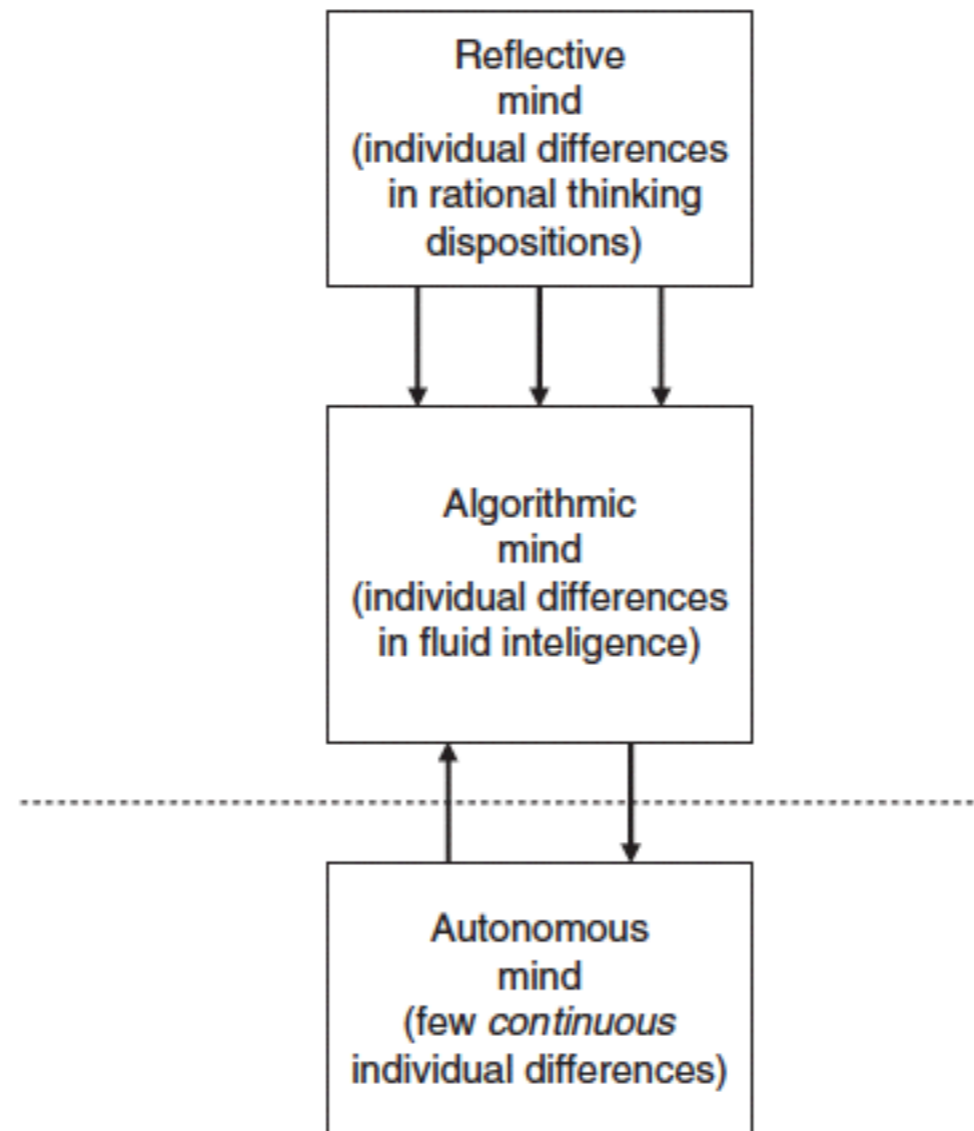
**Table 3.** Examples of the Four Types of Syllogism Used by Evans, Barston, and Pollard (1983) Together with Participant Acceptance Rates (as Valid Arguments) Combined Over 3 Experiments

Type	Argument	Acceptance rate
Valid-believable	No police dogs are vicious. Some highly trained dogs are vicious. Therefore, some highly trained dogs are not police dogs.	89% yes (correct)
Valid-unbelievable	No nutritional things are inexpensive. Some vitamin tablets are inexpensive. Therefore, some vitamin tablets are not nutritional.	56% yes (correct)
Invalid-believable	No addictive things are inexpensive. Some cigarettes are inexpensive. Therefore, some addictive things are not cigarettes.	71% yes (incorrect)
Invalid-unbelievable	No millionaires are hard workers. Some rich people are hard workers. Therefore, some millionaires are not rich people.	10% yes (incorrect)

Note. The data illustrate the typical findings that both belief and logic significantly influence responding. Also, the belief-bias effect is larger for invalid arguments. This interaction has been the cause of much theoretical debate but is not discussed in the present article.

# syllogism





**Fig. 3.1** Individual differences in the tripartite structure.

**Stanovich, K. (2011). Rationality and the reflective mind. Oxford University Press.**

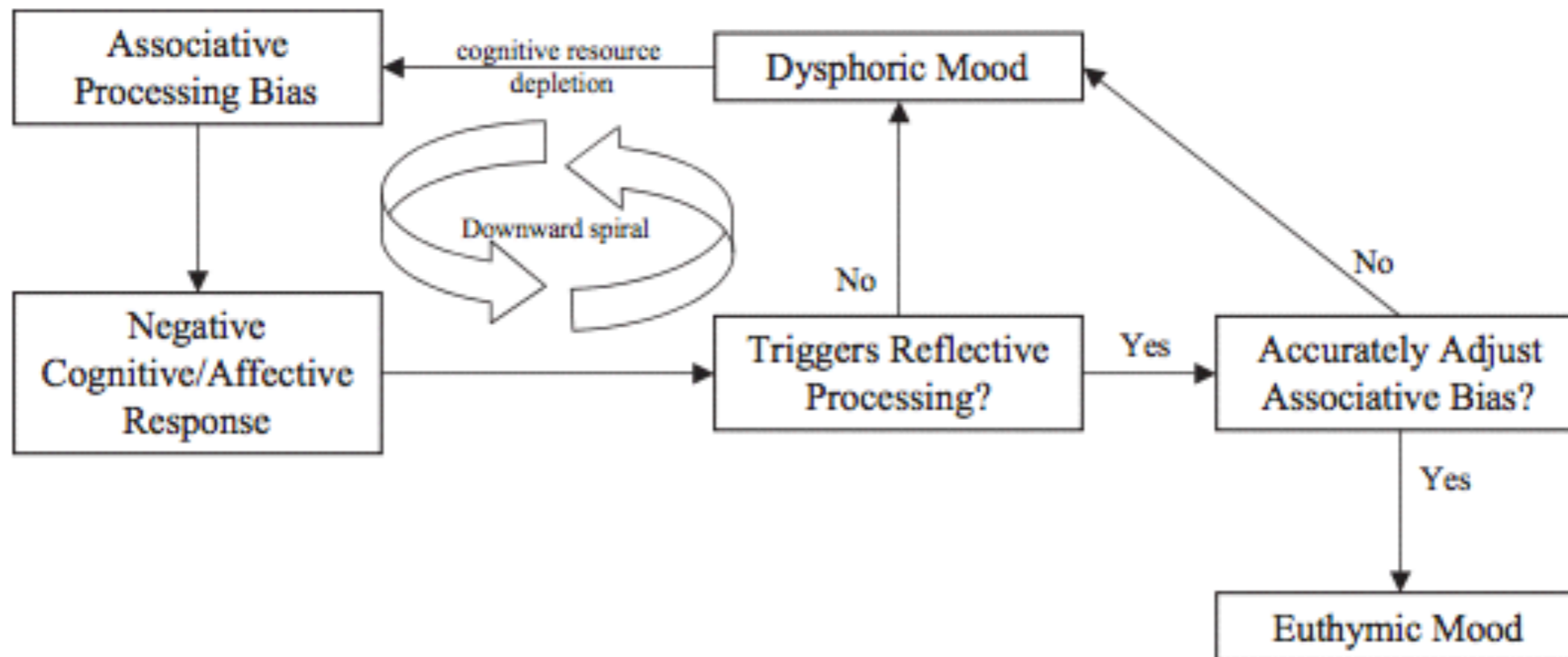


Fig. 1. A dual process model of cognitive vulnerability to depression.

**Beevers, C. G. (2005). Cognitive vulnerability to depression: A dual process model. *Clinical psychology review*, 25(7), 975-1002.**



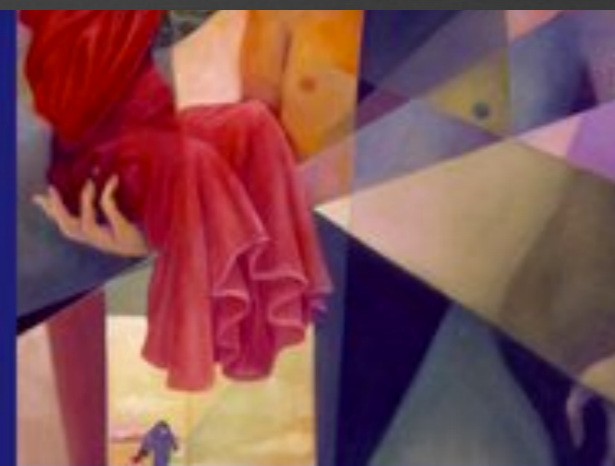
KEITH E. STANOVICH



# What Intelligence Tests Miss

the psychology of rational thought

## THE ROBOT'S REBELLION



*Rationality*

