

Models, Modeling, and Models

Wayne D. Gray

Cognitive Science Department, Rensselaer Polytechnic Institute

Talk Presented at the 56th Annual Meeting of the Human Factors &
Ergonomics Society
2012-October-24



TETRIS IS A TASK WE ALL KNOW!!

■ & some of us study

Terlecki, M. S., Newcombe, N. S., & Little, M. (2008). Durable and generalized effects of spatial experience on mental rotation: gender differences in growth patterns. *Applied Cognitive Psychology*, 22(7), 996–1013.

Kirsh, D. & Maglio, P. (1994). On distinguishing epistemic from pragmatic action. *Cognitive Science*, 18(4), 513–549.

Maglio, P. P., Wenger, M. J., & Copeland, A. M. (2008). Evidence for the role of self-priming in epistemic action: expertise and the effective. use of memory. *Acta Psychologica*, 127(1), 72–88.



SHERIDAN'S TAXONOMY OF MODEL ATTRIBUTES

	ATTRIBUTE	1 (LEAST)	2 (MODERATE)	3 (MOST)
A	DATA APPLICABILITY	No basis in existing data	Describes existing data	Predicts future data
B	DIMENSIONALITY	Single input, single output	Multi input, single output	Multi input, multi output
C	METRICITY	Limited to nominal relationships	Primarily ordinal relationships	Entirely cardinal relationships
D	ROBUSTNESS	Unique focus on limited objects or events	Moderate focus to a variety of objects or events	Comprehensive of a wide slice of nature
E	SOCIAL PENETRATION	Confined to a mental model	Communicated to the relevant community	Accepted and used by the relevant community



ORIGINAL SPACE FORTRESS (SF1): *The Learning Strategies Project*

- Early-80's
- DARPA funded (sort of)
- Mané and Donchin, 1989



SF3 – REVISED SPACE FORTRESS

- A nearly identical port of SF2 to play on the machines available in the 2000's
- Joystick dynamics changed in undeterminable ways between SF2 (used custom software now lost to history) and SF3
- Data logged once per second
- Setting up an experiment in RSF is a cumbersome process
 - Requires two computers
 - A server and client that need to be run independently
 - Experimental conditions need to be set up and users added to an Access™ database before the game can be played

Shebilske, W. L., Volz, R. A., Gildea, K. M., Workman, J. W., Nanjanath, M., Cao, S., & Whetzel, J. (2005). Revised space fortress: a validation study. *Behavior Research Methods*, 37(4), 591–601

ORIGINAL SPACE FORTRESS (SF1): *The Learning Strategies Project*

- Early-80's
- DARPA funded (sort of)
- Mané and Donchin, 1989

