Comments on Anderson

Independence assumption

Relation between Palmeri and Anderson and pros and cons of independence assumption (Bikram De)
"Anderson argues that the independence assumption does not prevent one from recognizing categories with correlated features but prevents representing categories where values on two dimensions are both one way or, the opposite [413]. Later Anderson discusses that this doesn't necessarily fail the algorithm [424]."
[1] Zaidi, Nayyar A., Jesús Cerquides, Mark J. Carman, and Geoffrey I. Webb. "Alleviating naive Bayes attribute independence assumption by attribute weighting." The Journal of Machine Learning Research 14, no. 1 (2013): 1947-1988.

The Independence Assumption is Absolutely Necessary (Gabriela Gresenz)
"If all categories have the same dependent dimensions, a single P(F|k) equation would be valid for that application but would not generalize to applications with different dependent dimensions. Instead of a general model, this would force domain-specific models each with a distinct P(F|k) equation. Thus, with the independence assumption Anderson obtains mathematical simplicity, model generality, and the ability to categorize groups with different dependent dimensions."

Me: Humans cannot nonlinearly separate. Anderson: Hold my beer! (Ali Ozdagli)
"The NLS problem is fascinating to me. Let's say my rational model is a support vector machine (instead of Bayesian analysis) for the sake of simplifying the problem in my mind. Basic SVMs cannot classify nonlinearly separable groups – unless you use a nonlinear kernel-. So does that mean that we have some sort of encoding or a set of the nonlinear kernel in our brains that we automatically apply to the data to categorize the object? Apparently, some research is looking into formalizing this further down the line (Levering et al.) with different approaches."
Levering, Kimery R., Nolan Conaway, and Kenneth J. Kurtz. "Revisiting the linear separability constraint: New implications for theories of human category learning." Memory & cognition (2019): 1-13."

Rational and Mechanistic models

Perhaps mechanist and rational models aren't so different? (Derek Gloudemans)
"Rational theory also defines governing rules for analysis; but rather than physical first principles the rules defined are goals of the system, definitions of the environment, and costs faced by the system in making decisions [p 409]. For reasoning about decision-making agents, I agree with Anderson that this set of "rules" is far more useful than a mechanist set of rules; this is because Anderson's rules are abstracted to a level close to the level at which interesting phenomena are observed."

Rational Theories over Mechanistic Theories (Carlos Olea)
"... a rational theory requires that an environment, goal and costs be identified as a basis for the mechanisms detailed. The optimal actions can then be derived and tested against results, then modified iteratively to come to a satisfactory theory. By contrast, a mechanistic theory denotes (to my knowledge) the detailing of internal mechanisms and their interactions, then modifying and refining them to fall in line with observed behavior.

There are two main reasons for which I believe the former is superior, those being tractability and applicability. I will also append a conjecture that stems from evolutionary theory as it applies to cognitive function development. "

Practical implementation of Rational Analysis in a Computer Model called COBWEB (Soumyajit Chakraborty)
"In the assigned reading, we have seen how human beings or computer models can do “Rational analysis” [3] to take a decision about some assigned task. Here is a brief methodology of rational analysis which can be found on wikipedia.org [1]"

Mind structure reflects world structure (Evan Segaul)
"The final line of the paper, “this does not tell us what the structure of the mind is, but it suggests that the mind has the structure it has because the world has the structure that it has”, is something that I found very noteworthy. When he previously mentioned that our minds can create categories without labels, but labels can help accelerate this categorization process, it was an extremely interesting connection to think of how the structure of our mind starts at this blank slate that we then add to as we maneuver through the world, have experienced, and group similar things together."

(Other) relationships with Palmeri and Cottrell

Connection of Computational Resources to the Novice/Expert Problem (Caleb Vatral)
"He says, “The subtle differences among the species within a superspecies category may not be worth the cost of maintaining separate categories”, which implies that the granularity of categorization, and thus one of the differences between novices and experts, is simply the computational and memory cost of maintaining the models (Anderson, pg. 424). Perhaps this is related to the concept of synaptic pruning, better known as “use it or lose it” (Santos 2011). "
Santos E., Noggle C.A. (2011) Synaptic Pruning. In: Goldstein S., Naglieri J.A. (eds) Encyclopedia of Child Behavior and Development. Springer, Boston, MA. https://doi.org/10.1007/978-0-387-79061-9_2856

Preliminary Connections between Anderson's Bayesian model and Palmeri Cottrell's model (Neel Kurupassery)
"One other parallel is in the mention that individuals extrapolate from experience [1 - page 410]. My thoughts in the previous journal entry was that expertise arises from instance-based learning, but novices were not completely "blank-slate" but have learning from what they are expected to know from society and from their own living in the world.?"