An Integrative Feedback Neural Network Model of Cognitive Dissonance

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Abstract: We present a feedback neural network model of cognitive dissonance. This model integrates key points of previous computational models of dissonance, as well as alternative models of dissonance, such as self-consistency models and Harmon-Jones action-based model. Further, the feedback nature of the model implements the parallel constraint satisfaction processes that are a computational implementation of Gestaltian structural dynamics, whereby a set of cognitive elements converges toward cognitive equilibrium, or good figure; these dynamics underlie Cognitive Dissonance Theory and related consistency theories. We simulate the results of several classic dissonance experiments and then demonstrate that this model can simulate the role of the self and standards of judgment in Stone and Cooper's Self to Standard Model. Thus, our neural network model provides a computational implementation of the Gestalt like processes that underlie classic cognitive consistency theories and provides an integrated computational account of different versions of Cognitive Dissonance Theory.