**Supplementary figure 1** Schematic diagrams illustrating how PFC and HPC information processing in the NAcc is modulated by tonic and phasic DA release.  

(a) PFC and HPC information processing in the NAcc is balanced via the effects of basal (tonic) DA release.  

(b) When phasic DA release is induced in the NAcc, HPC inputs are facilitated via D1 receptor activation, which in turn enhances NAcc activity. As a consequence, VP activity is suppressed, causing the PFC inputs to be attenuated by the increased tonic DA activation of D2 receptors stimulation.  

(c) On the other hand, when tonic DA release is decreased in the NAcc, PFC inputs are facilitated via decreased D2 receptor stimulation, which in turn would attenuate NAcc activity. As a result, VP activity is now further elevated, further suppressing tonic firing in VTA DA neuron.  

(d) Diagram illustrating that DA release maintains the balance between limbic and cortical synaptic inputs into the NAcc. With phasic DA and D1 receptor activation, the balance of information processing favors limbic inputs, which enhances NAcc neural activity and task stability. On the other hand, reduction of tonic DA release by suppression of tonic spike firing in DA neurons shifts the balances in favor of cortical inputs and task switching.