

cognitive functions to neural activity at the population and local circuit levels. Furthermore, as noted next, they also provide a link to psychopathology.

Disorders of Dynamic Coordination

What do failures of dynamic coordination in various forms of psychopathology tell us about its role in normal brain function? What do studies of the pathophysiology of those conditions reveal about its neuronal mechanisms? Silverstein (this volume) shows that psychopathology can provide a rich source of evidence linking behavior and cognition to neural activity at population and synaptic levels. In support of this view, consider the findings of Roopun et al. (2008). They show how the windows of opportunity for pyramidal cell spiking at gamma and beta frequencies depend on GABAergic and NMDA receptor activity, and they relate those mechanisms to changes in cortical dynamics that occur in schizophrenia. Furthermore, they provide evidence that there are variations in those rhythms and mechanisms across cortical regions, so we now need to discover the computational, cognitive, and psychopathological consequences of such variations. Finally, it was agreed that the theories of Friston (1999) and of Phillips and Silverstein (2003) have much in common. Friston suggested that the “disconnection” theory of schizophrenia could be referred to as the “dysconnection” theory. This label would then apply to both theories if it is understood that it is not connections in general that are malfunctional, but coordinating connections in particular.

Conclusion

Dynamic coordination makes fundamental contributions to brain function and cognition. Much is already known about why and how it does so, but much more remains to be discovered. Many concretely specified issues and predictions have now been identified that can be investigated using well-established or recently developed techniques. Over the coming decades, we expect substantial advances in our understanding of dynamic coordination in the brain, thereby building reliable bridges between neurobiological and psychological perspectives on mental life.