Many organizational phenomena are dynamic in nature, meaning that they evolve over time (Kozlowski, Chao, Grand, Braun, & Kuljanin, 2013; Lord, Diefendorff, Schmidt, & Hall, 2010; Neal, Ballard, & Vancouver, 2017; M. Wang, Zhou, & Zhang, 2016). As a result, many of the most influential theories in organizational psychology and organizational behaviour explicitly describe a dynamic process. Examples include Self Regulation Theory (Carver & Scheier, 1998), Conservation of Resources Theory (Hobfoll, 1989), Goal Setting Theory (Locke & Latham, 1990), *…[Mark – do you have a good example of a dynamic theory at the team level?]*…, and the Cultural Dynamics Model (Hatch, 1993). These theories describe a set of processes that unfold within individuals, teams, or organizations over time, producing complex patterns of change. Understanding these dynamics is further complicated by the fact there is often a combination of processes at play, and these processes may unfold in different ways for different people or groups.

In order to test a dynamic theory, the researcher needs a statistical model that operationalizes the processes described by that theory (Collins, 2006). This can be difficult to do using standard statistical models. With these models, the researcher is typically forced to distil a rich, dynamic theory into a set of simple predictions regarding the direction of relationships between variables. For example, using Self-Regulation Theory, one might predict that people will apply more effort in pursuit of a goal as the difficulty of the task increases, and test that hypothesis using some form of growth modelling. However, the theory assumes that there is a higher level control process that regulates how the person responds to difficulty. As such there is a range of different ways that people can respond to difficulty, including changing strategy, extending the deadline, adjusting the goal or abandoning the task (Neal, et al., 2017). This means that support for the hypothesis can not necessarily be taken as evidence for the theory. This is problematic because it inhibits our ability to directly test dynamic theory. *[Tim, can we try to weave something into the description of the problem in this para, so that when the reader gets to the next para, a Bayesian approach seems like a perfectly natural choice? Eg., is it something about uncertainty, prior knowledge, hierarchical structures, populations, distributions, etc? Maybe frame it as a challenge for researchers, eg the challenge for researchers is to draw inferences from longitudinal data regarding …..]*

*TB: My first thought would be make a two-pronged argument about the hierarchical structure and uncertainty. The hierarchical structure is important to touch on here given the theme of the issue is around multilevel modeling. So the argument would be about needing to account for a) process that are unfolding over time within individuals b) individual differences in these processes c) invariances at the sample level. Moreover, the constructs we’re interested in are not directly observed, so we need models need to account for uncertainty in the parameters that govern the process. The Bayesian approach provides a natural way of handling both of these issues. Mark, what do you think?*

For cumulative theoretical process to be made in this area, we need a flexible statistical framework that is capable of representing the complexity and dynamism inherent in our theories. In this paper, we demonstrate an approach that we believe is ideally suited for this purpose. This approach takes advantage of recent advances in Bayesian statistical modelling (Hoffman & Gelman, 2014; Carpenter et al., 2017), which have made it possible to implement highly customised models in a fairly straightforward manner. The flexibility of this approach allows the researcher to test relatively specific theoretical assumptions regarding dynamic theory. This ensures a close coupling between the dynamic theory and the statistical model used to test the theory, which we believe will help accelerate theoretical progress.