A major focus of phonological analysis in the past fifty years has been ways in which phonological processes misapply in morphologically complex words. Three main mechanisms have been proposed for allowing morphological structure to influence phonological application: (1) morphologically sensitive prosodification, which may create phrase boundaries at morphological boundaries, (2) cyclic evaluation, in which phonological processes may apply to morphological subconstituents, and (3) uniform exponence constraints, which may cause processes to misapply in order to achieve identity with morphologically related surface forms. After two decades of vigorous debate, the necessity of uniform exponence constraints remains controversial, with different languages providing opposing arguments for and against them. The debate has typically focused, sensibly, on the minutiae of specific processes, ferreting out edge cases in the language that might distinguish the approaches (e.g., Bobaljik 2008, Albright 2008, Trommer 2013). In this talk, I take a complementary approach, and focus on two types of misapplication that are uniquely predicted by an output-output faithfulness approach. Both are illustrated with data from Lakhota (Siouan). The first concerns faithfulness to non-contrastive phonetic details of surface forms. Drawing data from verb paradigms, compounds, and object incorporation, I show that the quality of aspiration shows a complex phonologically and morphologically sensitive distribution, which conspires to create uniform verb paradigms. The I argue that a cyclic account would not be sensitive to this level of phonetic detail at the necessary stage of the derivation, and there is no prosodic boundary to condition misapplication. The second prediction concerns the simultaneous misapplication of multiple processes. Prosodic and cyclic accounts rely on a single hierarchical or derivational structure, which should be consistent across all processes. Output-output faithfulness constraints, on the other hand, may demand identity to different extents to different bases, for different processes. I consider evidence from aspiration, vowel deletion, glottal stop epenthesis, showing that processes may misapply independently. This parallels similar findings from English and Japanese, and illustrates the importance of analyzing (mis)application of multiple processes in a language simultaneously.