Why do low LCLs and strong low-level environmental vertical wind shear favor tornadoes?

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From a combination of theory, observations, and idealized simulations, we believe we have identified a plausible explanation for why tornadic supercells are favored in environments that have low lifting condensation levels (LCLs) and contain strong low-level wind shear. In the absence of pre-existing near-surface vertical vorticity, vertical vorticity can only develop next to the surface within air parcels that have descended from above via downdrafts (baroclinic vorticity generation experienced during the descent is also believed to be crucial for the development of vertical vorticity within these parcels). In other words, near-surface vertical vorticity develops within the outflow of supercells. The development of near-surface vertical vorticity is a necessary but insufficient condition for tornadogenesis; this vorticity must subsequently experience intense vertical stretching in order to reach tornado strength. The intense stretching of this vorticity (which is usually associated with negative buoyancy given that the vorticity develops within downdrafts/outflow) requires the upward-directed vertical perturbation pressure-gradient force (VPPGF) to greatly exceed the negative buoyancy. The VPPGF ("upward sucking") increases as the low-level environmental shear increases. Moreover, the negative buoyancy of the vertical-vorticity-bearing outflow is suppressed by high boundary-layer relative humidity (low LCLs). We are unable to refute the hypothesis that the combination of low LCLs and strong environmental low-level vertical wind shear favor tornadic supercells because such environments inhibit cold pools and strengthen the dynamically forced ascent at low levels, thereby increasing the odds that near-surface vertical vorticity is stretched to tornado strength despite its downdraft origins and negative buoyancy.