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Steven M Gonek* (gonek@math.rochester.edu), Department of Mathematics, University of Rochester, Rochester, NY 14627. *The Lindelöf hypothesis for primes is equivalent to the Riemann hypothesis.*

The classical Lindelöf hypothesis is equivalent to a certain estimate for the sums $\sum_{n \leq x} n^{it}$. We propose that a more general form of the Lindelöf hypothesis is true, one involving similar estimates for sums of the type

$$\sum_{\substack{n \leq x \\ n \in \mathcal{N}}} n^{it},$$

where \mathcal{N} can be a rather general sequence of real numbers. We support this with various examples and show that when \mathcal{N} is the sequence of prime numbers, the truth of our conjecture is equivalent to the Riemann hypothesis. Moreover, if our conjecture holds when \mathcal{N} is the sequence of primes congruent to $a \pmod{q}$, with a coprime to q , then the Riemann hypothesis holds for all Dirichlet L -functions with characters modulo q , and conversely. These results suggest that a general form of the Lindelöf hypothesis may be true that is in some sense more fundamental than either the classical Lindelöf hypothesis or the Riemann hypothesis. This is joint work with Sid Graham and Yoonbok Lee. (Received September 18, 2018)