**Validation of Mathematical Models**, Daniel Solow**,** to appear in The American Scientist.

Mathematical models are everywhere and they are often used to make predictions. As those predictions vary greatly in their accuracy, one is led naturally to ask whether such predictions can, or should, be trusted. This article discusses a variety of reasons why such predictions might be inaccurate and identifies several approaches for determining when it is, and is not, reasonable to trust them. Illustrative examples are presented from diverse disciplines. One surprising result is the possibility that black holes might not be ``black''.