

This paper both critiques and extends Dzhafarov's (1992). *J. Mathematical Psychology*, 36, 235-268.) decomposition of simple reaction times into decision and residual latencies. The decomposition, which is based on estimating quantities in the limit of infinite intensity, is designed to discriminate between two simple models: (1) the residual and decision latencies are stochastically independent, and (2) both the residual and the decision latencies are assumed to be increasing functions of a common, underlying criterion. It is shown that Dzhafarov's decomposition is of little practical value because the estimators of the critical asymptotic quantities are both variable and biased in such a manner that when model 1 is correct, the method fails to reject model 2. To overcome this problem a new test is proposed, and it appears to have vastly increased statistical power. In contrast to Dzhafarov's analysis, the application of the new test to Dzhafarov's motion detection data set rejects model 2.