1125-65-2713 **Fred J Hickernell*** (hickernell@iit.edu), Department of Applied Mathematics, Illinois Institute of Technology, RE 208, 10 W. 32nd St., Chicago, IL 60616. *The Trio Identity for Cubature Error.*

Xiaoli Meng introduced the trio identity for expectations of random variables during an invited talk of the 2016 Joint Mathematics Meetings. Here we extend his ideas to multidimensional integration problems, which may also be written as expectations of random variables: $\mu = \mathbb{E}[f(X)] = \int f(x)\,\nu(\mathrm{d}x)$. Here X is a random variable following probability measure ν. Such integrals are approximated by weighted sums, $\hat{\mu} = \sum_{i=1}^{n} w_i f(X_i)$. We show how the error, $\mu - \hat{\mu}$, can be represented as the product of the confounding, the discrepancy, and the variation. This trio identity holds for deterministic, randomized, and Bayesian settings. (Received September 20, 2016)