A note on the Formanek Weingarten function

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The aim of this note is to compare work of Formanek [2] on a certain construction of central polynomials with that of Collins [1] on integration on unitary groups.

These two quite disjoint topics share the construction of the same function on the symmetric group, which the second author calls *Weingarten function.*

By joining these two approaches we succeed in giving a simplified and *very natural* presentation of both Formanek and Collins's Theory.

References

[1] Collins, Benoît,*Moments and cumulants of polynomial random variables on unitary groups, the Itzykson-Zuber integral, and free probability.* Int. Math. Res. Not. 2003, no. 17, 953–982

[2] E. Formanek, *A conjecture of Regev about the Capelli polynomial,* J. Algebra **109** (1987), 93-114.