ADDENDUM TO
“SOME POLYNOMIALS DEFINED BY
GENERATING RELATIONS”

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ABSTRACT. Certain constraints are explicitly specified for the validity of a recent result involving a multivariate generating function, due to the present authors [1, p. 369, Theorem 6]. It is also indicated how this result can be further generalized. (See Theorem 6* below.)

It should be pointed out that Theorem 6 (p. 369) of [1] holds as stated if and only if

\[ \lambda_j = \lambda \quad \text{and} \quad q_j = q, \quad \forall j \in \{1, \ldots, r\}, \]

where \( \lambda \) is an arbitrary constant, real or complex, and \( q \) is a positive integer.

In general, however, for arbitrary complex parameters \( \lambda_1, \ldots, \lambda_r \), and arbitrary positive integers \( q_1, \ldots, q_r \), not necessarily all equal as in equation (†) above, Theorem 6 should be replaced by

**Theorem 6*. Let the parameters \( \alpha, \beta \) and \( \lambda_1, \ldots, \lambda_r \), and the coefficients \( C(k_1, \ldots, k_r), k_j \geq 0, \forall j \in \{1, \ldots, r\} \), be arbitrary complex numbers independent of \( n \). Also let the sequence of polynomials

\[ \Lambda_n^{(\alpha, \beta)}[\lambda_1, \ldots, \lambda_r; q_1, \ldots, q_r; z_1, \ldots, z_r] \]

be defined by equation (40) on p. 369 of [1] for \( n = 0, 1, 2, \ldots \), and for arbitrary positive integers \( q_1, \ldots, q_r \), independent of \( n \).

Then

\[
\sum_{n=0}^{\infty} \frac{\alpha}{\alpha + (\beta + 1)n} \left( \begin{array}{c} \alpha + (\beta + 1)n \\ n \end{array} \right) \Lambda_n^{(\alpha, \beta)}[\lambda_1, \ldots, \lambda_r; q_1, \ldots, q_r; z_1, \ldots, z_r] t^n = (1 + w)^{\alpha} H^*[\alpha, \beta; z_1(-w)^{\alpha_1}(1 + w)^{\lambda_1}, \ldots, z_r(-w)^{\alpha_r}(1 + w)^{\lambda_r}],
\]

Received by the editors August 20, 1976.


Key words and phrases. Complex parameters, multivariate generating functions, (multidimensional) polynomial sequences.

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where \( w \) is a function of \( t \) defined by equation (8) on page 361 of [1], and

\[
H^*[\alpha, \beta; u_1, \ldots, u_r] = \sum_{k_1, \ldots, k_r = 0}^{\infty} \frac{\alpha}{\sum C(k_1, \ldots, k_r) u_1^{k_1} \cdots u_r^{k_r}}
\]

with, for convenience,

\[
Q(k) = q_1 k_1 + \cdots + q_r k_r \quad \text{and} \quad \Lambda(k) = \lambda_1 k_1 + \cdots + \lambda_r k_r.
\]

**Remark.** Evidently, in the general case considered in [1], the above equations (41*) and (42*) would replace our earlier relationships (41) and (42), respectively.

**Reference**


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