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TYPE, COTYPE AND GENERALIZED RADEMACHER FUNCTIONS

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ABSTRACT. The main goal of this paper is to show that the traditional Rademacher functions can be replaced, up to a change of constants, by the generalized Rademacher functions in the definitions of type and cotype in complex Banach spaces. It is also shown that there are standard type Kahane inequalities for the generalized Rademacher functions. As an application we prove the continuity of the tensor product of certain multilinear mappings and homogeneous polynomials.

Introduction. The generalized Rademacher functions, which were introduced by Aron and Globevnik [**2**], have been used by several authors to prove new theorems and to provide simpler proofs of known results, especially in the theory of multilinear mappings and homogeneous polynomials between Banach spaces, e.g., [**1, 3, 8, 9, 12**] and [**14**]. An important result was obtained by Floret and Matos in [**8**]: if we replace the traditional Rademacher functions by the generalized ones in Khintchine's inequalities, the resulting inequalities are still true (we prove the same for Kahane's inequalities in Section 5). Since the notions of type and cotype in Banach spaces are usually introduced with the help of the traditional Rademacher functions, it is natural to ask what happens if we replace the Rademacher functions by the generalized ones in such definitions. The main result of this paper, Corollary 4.2, provides the answer: nothing happens. In other words, given $n \in \mathbf{N}$, $n \geq 2$, if the n-Rademacher functions take the place of the traditional Rademacher functions in the definitions of type and cotype in complex Banach spaces, the resulting definitions are equivalent to the original ones (up to a change of constants). The proof is an adaptation of the proof of the equivalence between the notions of Rademacher and Gaussian types and cotypes. The basic difficulty is the fact that, if $n > 2$, the n-Rademacher functions are no longer real-valued symmetric random variables. To solve this problem we must introduce the notion

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