

## ON THE MULTILINEAR GENERALIZATIONS OF THE CONCEPT OF ABSOLUTELY SUMMING OPERATORS

ERHAN ÇALIŞKAN AND DANIEL M. PELLEGRINO

**ABSTRACT.** In this paper we investigate the several multilinear generalizations of the concept of absolutely summing operators and their connections. We also introduce the concept of  $p$  semi-integral mappings and establish the position of  $p$  semi-integral mappings with respect to the other classes.

**1. Introduction and notation.** The core of the theory of absolutely summing operators lies in the ideas of A. Grothendieck in the 1950s. Further work of Pietsch [23] and Lindenstrauss and Pełczyński [9] clarified Grothendieck's insights, and nowadays the ideal of absolutely summing operators is a central topic of investigation. For details on absolutely summing operators we refer to the book by Diestel-Jarchow-Tonge [7].

A natural question is how to extend the concept of absolutely summing operators to multilinear mappings and polynomials. A first light in this direction is the work by Alencar-Matos [1], where several classes of multilinear mappings between Banach spaces were investigated. Since then, just concerning the idea of lifting the ideal of absolutely summing operators to polynomials and multilinear mappings, several concepts have appeared and so far none of the definitions proposed appears as clearly better or more useful than the rest. However, there seems to be no effort in the direction of comparing all these different classes. The aim of this paper is to investigate the connections between these classes, to introduce the class of  $p$  semi-integral mappings and to establish the position of  $p$  semi-integral mappings with respect to the other concepts.

---

2000 AMS *Mathematics Subject Classification.* Primary 46G25, Secondary 46B15.

The first author is supported by CNPq (Brazil) and the second author is partially supported by CNPq Grants 471054/2006-2 and 308084/2006-3 and FAPESQ/CNPq.

Part of this paper is a portion of the second author's doctoral thesis, written under supervision of Professor M.C. Matos.

Received by the editors on Sept. 1, 2004, and in revised form on March 8, 2005.