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Generalizations and variants of associativity for variadic  
functions: a survey

For any nonempty set  $X$ , we let  $X^*$  denote the set of all tuples on  $X$ . We endow  $X^*$  with the concatenation operation for which we use the juxtaposition notation.

Recall that a function  $F: X^* \rightarrow X^*$  is said to be *associative* if, for every  $\mathbf{x}, \mathbf{y}, \mathbf{z} \in X^*$ , we have  $F(\mathbf{xyz}) = F(\mathbf{x}F(\mathbf{y})\mathbf{z})$ . Also, for any nonempty set  $Y$ , a function  $F: X^* \rightarrow Y$  is said to be *preassociative* if, for every  $\mathbf{x}, \mathbf{y}, \mathbf{y}', \mathbf{z} \in X^*$ , we have  $F(\mathbf{xyz}) = F(\mathbf{xy}'\mathbf{z})$  whenever  $F(\mathbf{y}) = F(\mathbf{y}')$ .

In this presentation we survey the most recent results obtained on these properties as well as their barycentric versions.

**References**

- [1] E. Lehtonen, J.-L. Marichal, B. Teheux, *Associative string functions*, Asian-European J. of Math. **7** (2014), 1450059 (18 pages).
- [2] J.-L. Marichal and B. Teheux, *Barycentrically associative and preassociative functions*, Acta Mathematica Hungarica **145** (2015), 468–488.