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**Rajkumar Verma\*** (rkver83@gmail.com), Department of Management Control and, information, University of Chile, Av. Diagonal Paraguay 257, 8330015 Santiago, Chile, **Abha Aggarwal** (abhaaggarwal127@gmail.com), University School of Basic and Applied Scien, Guru Gobind Singh Indraprastha University, Delhi, 110078, India, and **José M. Merigó** (jmerigo@fen.uchile.cl), Department of Management Control and, information, University of Chile, Av. Diagonal Paraguay 257, 8330015 Santiago, Chile. *A new approach to solve 2-tuple linguistic matrix games based on linguistic scale functions.*

Game theory has been found successful applications in a variety of decision-making areas. To model uncertainty and vagueness in real-world decision problems, many studies have been carried out to solve matrix game problems with interval, fuzzy, and intuitionistic fuzzy numbers payoffs. Fuzzy linguistic variables are very useful and efficient tools to represent uncertain or vague information. To avoid information loss during the linguistic operational process, the 2-tuple linguistic (2-TL) model was introduced for computing with words. In recent years, a wide range of decision-making approaches has been developed with 2-TL information. The objective of this work is to study a 2-player constant-sum matrix game with 2-TL payoffs based on linguistic scale functions. For doing so, first, we propose a new aggregation operator for aggregating 2-TL information by utilizing the linguistic scale functions and prove their basic properties. Then, the paper formulates a linguistic linear programming (LPP) model to solve a constant-sum matrix game problem with 2-TL payoffs based on the proposed aggregation operator. Finally, a real-life matrix game problem is considered to demonstrate the process and the applicability of the proposed method in solving matrix games under the 2-TL environment. (Received September 17, 2019)