Fixed Point Theory, 20(2019), No. 2, 703-714 DOI: 10.24193/fpt-ro.2019.2.46 http://www.math.ubbcluj.ro/~nodeacj/sfptcj.html

GENERALIZATIONS OF EDELSTEIN'S FIXED POINT THEOREM IN COMPACT METRIC SPACES

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Abstract. We study deeply some fixed point theorem in compact metric spaces proved very recently, generalizing this theorem. We also show this theorem is a generalization of the famous Edelstein's fixed point theorem.

Key Words and Phrases: Nonspreading mapping, condition (CC), fixed point, convergence theorem, quasimetric space, Edelstein's fixed point theorem.

2010 Mathematics Subject Classification: 54H25.

Acknowledgment. The author is very grateful to the referee for his/her careful reading.

Competing interests. The author declares that he has no competing interests.

References

- K. Aoyama, S. Iemoto, F. Kohsaka and W. Takahashi, Fixed point and ergodic theorems for λ-hybrid mappings in Hilbert spaces, J. Nonlinear Convex Anal., 11(2010), 335-343.
- [2] K. Aoyama, F. Kohsaka, Fixed point theorem for α-nonexpansive mappings in Banach spaces, Nonlinear Anal., 74(2011), 4387-4391.
- [3] F.E. Browder, On the convergence of successive approximations for nonlinear functional equations, Nederl. Akad. Wetensch. Proc. Ser. A 71=Indag. Math. 30(1968), 27-35.
- [4] J.B. Diaz, F.T. Metcalf, On the structure of the set of subsequential limit points of successive approximations, Bull. Amer. Math. Soc., 73(1967), 516-519.
- [5] M. Edelstein, On fixed and periodic points under contractive mappings, J. London Math. Soc., 37(1962), 74-79.
- [6] J. Jachymski, Remarks on contractive conditions of integral type, Nonlinear Anal., 71(2009), 1073-1081.
- [7] J. Jachymski, Around Browder's fixed point theorem for contractions, J. Fixed Point Theory Appl., 5(2009), 47-61.
- [8] J. Jachymski, I. Jóźwik, Nonlinear contractive conditions: a comparison and related problems, Fixed point theory and its applications, 123-146, Banach Center Publ., 77, Polish Acad. Sci., Warsaw, 2007.

The author is supported in part by JSPS KAKENHI Grant Number 16K05207 from Japan Society for the Promotion of Science.

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- [9] T. Kawasaki, W. Takahashi, Existence and mean approximation of fixed points of generalized hybrid mappings in Hilbert spaces, J. Nonlinear Convex Anal., 14(2013), 71-87.
- [10] M. Kikkawa, T. Suzuki, Fixed point theorems for new nonlinear mappings satisfying Condition (CC), Linear Nonlinear Anal., 1(2015), 37-52.
- [11] P. Kocourek, W. Takahashi, J.C. Yao, Fixed point theorems and weak convergence theorems for generalized hybrid mappings in Hilbert spaces, Taiwanese J. Math., 14(2010), 2497-2511.
- [12] F. Kohsaka and W. Takahashi, Fixed point theorems for a class of nonlinear mappings related to maximal monotone operators in Banach spaces, Arch. Math. (Basel), 91(2008), 166-177.
- [13] T. Suzuki, A new type of fixed point theorem in metric spaces, Nonlinear Anal., 71(2009), 5313-5317.
- [14] T. Suzuki, Fixed point theorems for a new nonlinear mapping similar to a nonspreading mapping, Fixed Point Theory Appl., 2014, 2014:47.
- [15] T. Suzuki, Comments on some recent generalization of the Banach contraction principle, J. Inequal. Appl., 2016, 2016:111.
- [16] T. Suzuki, Another generalization of Edelstein's fixed point theorem in generalized metric spaces, Linear Nonlinear Anal., 2(2016), 271-279.
- [17] T. Suzuki, B. Alamri, M. Kikkawa, Edelstein's fixed point theorem in generalized metric spaces, J. Nonlinear Convex Anal., 16(2015), 2301-2309.
- [18] T. Suzuki, M. Kikkawa, Generalizations of both Cirić's and Bogin's fixed point theorems, J. Nonlinear Convex Anal., 17(2016), 2183-2196.
- [19] T. Suzuki, M. Kikkawa, C. Vetro, The existence of best proximity points in metric spaces with the property UC, Nonlinear Anal., 71(2009), 2918-2926.
- [20] W. Takahashi, Fixed point theorems for new nonlinear mappings in a Hilbert space, J. Nonlinear Convex Anal., 11(2010), 79-88.

Received: January 19, 2017; Accepted: June 14, 2017.

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