



## Pride and Passion: Remarks on Thomas L. Saaty's Final Papers

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*We all have to go sometime.*

–Thomas L. Saaty.

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**Abstract.** Thomas L. Saaty, a world-renowned scholar and our beloved Advisory Editor, passed away on August 14, 2017 at the age of 91. He has made many fundamental contributions to operations research, analytics, business and mathematics. Despite his heavy illness for 14 months, as passionate about science, he has also enthusiastically published his research. We review his final works published in 2017 and 2018. We are also honored to reveal and publish his final statements on neural firing and synthesis in making comparisons & life satisfaction, respectively, in his final two papers; the previous one submitted by him just before his passing and the other one submitted by his co-authors after his death to European Journal of Pure and Applied Mathematics (EJPAM).

We just would like to remember and honor Saaty's memory by publishing his final papers at EJPAM and this humble remarks dedicated to the memory of Thomas L. Saaty on the occasion of the first anniversary of his passing, August 14, 2018.

**2010 Mathematics Subject Classifications:** 90B50, 90C29,91B06,92B20, 91C05, 82C32

**Key Words and Phrases:** Thomas L. Saaty, Measurement theory, Neural networks, Analytic Hierarchy Process, AHP, Analytic Network Process, ANP

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### 1. Introduction

Thomas L. Saaty is, a world-renowned scholar, passed away on August 14, 2017 at the age of 91. Prof. Saaty was Distinguished University Professor, the highest faculty rank, in Joseph M. Katz Graduate School of Business at University of Pittsburgh. He was/is also our Advisory Editor at European Journal of Pure and Applied Mathematics. He is best known as the creator and father of the decision-making mechanisms Analytic Hierarchy Process (AHP) and Analytic Network Process (ANP) for resolving complex problems.

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Saaty was the recipient of the University of Pittsburghs highest honor for research, the Chancellors Distinguished Research Award, and also received the Katz School's H.J. Zoffer Medal for Meritorious Service in recognition of his years of service. He also received many awards, including the Impact Prize from INFORMS and the Gold Medal from the International Society for Multi-Criteria Decision Making [1].

Thomas L. Saaty has made many fundamental contributions to operations research, analytics and mathematics, and his published research has now accumulated more than 102,000 citations by other researchers, with an h-index of 92 (i.e., 92 publications each with more than 92 citations). This large number of citations to his work are a clear manifestation of his immense impact on management science, business, mathematics and other fields of science.

We are honored to reveal and publish his final statements on neural firing and synthesis in making comparisons life satisfaction, respectively, in his final two papers; the previous one submitted by him just before his passing and the other one submitted by his co-authors after his death to European Journal of Pure and Applied Mathematics.

## 2. Saaty's Final Works

Thomas L. Saaty had never stopped producing, teaching and innovating, and he has been still brightening. In his lovely wife Rozann Saatys words:

*“He had cancer but survived for 14 months after it was discovered. During that time he lived life as usual, teaching his classes at the University of Pittsburgh (his last Creativity class ended in June), and writing books and papers. We even traveled to China late last year for a memorable career-capping trip. Tom lived an amazingly productive life that I was privileged to share for the 53 years of our marriage. He had an unbelievable mind, memory, and intellectual curiosity. He was my personal Wikipedia; I could get the answer to anything about AHP and ANP (book and page number), or statistics about countries around the world, or facts about geography. His mind never failed him. Two weeks ago he was teaching the doctor attending him in his sick bed a clever proof he had of the Pythagorea (all from his memory he avoided paper and pencil when he could).”*

Although he had been bravely battling a grave illness, as a role model, he has been contributing outstanding works to literature. We review his final works that published in 2017 and 2018.

He published his research on neurons the decision makers in two parts; Part I [2] and Part II [3] in February 2017. Saaty and Rokou [4] published their work in the prioritization of inventions in March 2017. His contribution on the brain and mind as a system appeared in [5] (accepted June 03, 2017) when on mathematics of the brain published in [6] (accepted June 05, 2017). Saaty and De Paola [7] worked and published on the design and urban planning for the cities of the future in 2017 (submitted on June 13, 2017). Gu, Saaty and

Wei [8] published their work in technological innovation efficiency of industrial enterprises in early 2018.

### 3. Saaty's Final Works Published at EJPAM

As our beloved Advisory Editor since its foundation in 2007, Thomas L. Saaty published two of his final papers and one fundamental paper in the inaugural issue as the first contributor in 2008 at the European Journal of Pure Applied Mathematics. His final papers are as follows in more detail.

#### 3.1. Origin of Neural Firing and Synthesis in Making Comparisons

Thomas L. Saaty submitted his final paper (co-authored by Prof. Luis G. Vargas, his colleague at University of Pittsburgh) on neural firing and synthesis in making comparison in Saaty and Vargas [9] submitted on June 1, 2017, and the paper was published at European Journal of Pure and Applied Mathematics on July 11, 2017, just one month before his passing.

As a component of his series on mathematical facts of the brain and neurons, in this interesting paper [9], Saaty and Vargas discuss the work principle of reciprocal comparisons, mathematical generalization of discrete judgments to continuous judgments and synthesis of neural responses. They show that because reciprocal pairwise comparisons are performed at the neural level, the division algebra of the octonions, in which commutativity and associativity are not satisfied, provides the structure needed to represent mental processes and that these processes could be represented in G2-manifolds.

#### 3.2. An Indicator of One's Life Satisfaction

Saaty's last and final paper [10] entitled An Indicator of One's Life Satisfaction which submitted by his co-authors Dean Emeritus Prof. H.J. Zoffer and Prof. Lirong Wei (his colleagues at University of Pittsburgh) after he died on April 18, 2018, to European Journal of Pure and Applied Mathematics (EJPAM). This exciting paper is published on July 31, 2018 simultaneously with this work at EJPAM.

His co-author Zoffer confirms that this paper will be the last paper to be published in Saaty's illustrious career and uses his Analytic Hierarchy Process in an area where it has not previously been applied, as far as they know.

Saaty, Zoffer and Wei [10] develops an Analytic Hierarchy Process model over 58 criteria and subcriteria available in cumulated literature about satisfaction, related to satisfaction or fulfillment. These criteria/subcriteria cover all dimensions from human rights and love relation to health and charity, to shelter and housing, to climate.

Another good contribution, as the authors also develop an MS Excel template as a powerful spreadsheet tool so that readers can rate their satisfaction on each of the subcriteria in the structure to obtain an overall measure of satisfaction with their life. Someone who feels they have a perfect life would get 100%. The Excel template can be used by any individual to determine what grade they get in life satisfaction [10].

As a user friendly and entertaining tool, readers may get the model to assess reader's level of life-satisfaction proposed in that paper at [https://1drv.ms/x/s!Ao0b6FaIKSXM\\_AiH8x7JG5E09QCV](https://1drv.ms/x/s!Ao0b6FaIKSXM_AiH8x7JG5E09QCV).

#### 4. A Final Note

As Founders and Editors-in-Chief, and community of the European Journal of Pure and Applied Mathematics, we mourn passing of Thomas L. Saaty who is our beloved forever Advisory Editor and dearly miss him. We are highly honored to reveal and publish Thomas L. Saaty's final two outstanding papers; one [9] submitted just before his death- Saaty saw its publication and highly appreciated- whereas the other one [10] submitted after he died.

We notice that when considered he had been bravely battling a heavy illness, it is meaningful that his final papers and works on somewhat neural activity and brain, and life satisfaction.

Another fascinating phenomenon is that Saaty was first recruited to the Katz School in 1979 by Dean Emeritus Professor H. J. Zoffer [1] who is also co-author of Saaty's last paper on life satisfaction at the same time.

Thomas L. Saaty submitted his another outstanding huge paper entitled The Analytic Hierarchy and Analytic Network Measurement Processes: Applications to Decisions under Risk [11] in 2007 as the first contributor to European Journal of Pure and Applied Mathematics in the inaugural issue when he publishes his two final papers at the same journal, EJPAM.

We just would like to remember and honor Saaty by publishing his final papers at EJPAM and this humble remarks dedicated to the memory of Thomas L. Saaty on the occasion of the first anniversary of his passing, August 14, 2018.

Thomas L. Saaty is survived by his wife, Rozann Saaty; his children, Linda, Michael, Emily, John, and Daniel. As his lovely wife Rozann says:

*"The best way to honor his memory is to spread awareness of AHP!"*

. They are prideful and doing their best to honor Saaty's memory through their foundation Creative Decisions Foundation, and companies SuperDecisions Software and RWS Publications and other efforts.

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