Applying Fuzzy Logic to Measure the Intensity of Volunteering Intentions: A Study on Intrinsic and Extrinsic Motivations in Organizational Behavior

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Abstract

The theories of organizational behavior are aimed to employee's efficiency and consistent productivity. This study introduced intrinsic motivation of individual volunteering intentions based on trigger and religion whereas extrinsic motivation consisting instrumental and social intention mode. The performance of individual depends upon inner energetic force which will incorporate intention, direction and intensity of work. Organizations are involved with volunteer work that requires motivation to participate and sustain in auxiliary activities. Individual with volunteer motivation have goal and the direction, to measure the intensity of their motivational work using fuzzy logic. With the help of fuzzy logic, which proposed and rationally determine the intensity, this study has provided a logical and visual depiction of volunteering intention.

Keywords: Organizational Behavior, Motivation, Volunteer Intention, Fuzzy Logic.

Introduction

Over the past few decades, volunteering has been increasingly important as a pro-social behavior in both rich and developing countries. Motivated volunteers are of interest to a wide range of stakeholders. There is increasing demand on nonprofit organizations to manage its unpaid employees, or volunteers. Understanding the motivations behind those volunteers' pro-social actions is therefore unavoidable. Furthermore, it is a fact that individuals differ from one another and have distinct personal reasons for volunteering. Therefore, it is necessary to comprehend those motivations from a personal perspective.

Volunteering is a curious phenomenon for various reasons. It is not an action which simply happens when there is no obligation. There is much cost involved at the end of the volunteer, as one is giving time and efforts also sacrificing upon opportunity. It is not a onetime act instead sustained efforts for volunteering over an extended time period are indispensable. Before Indulging in more details, the concept of volunteering needs to be clarifies. According to Mano (2012) volunteering is unforced activity without any financial reward for individuals other than self and is a result of socialization and fulfillment of societal expectations.

Volunteering develops a sense of social and community based goals in an individual. Currently, volunteerism has been chosen for personal development (Harnish et al., 2016), educational experience (Harnish et al., 2016). Moreover, volunteering has been found having good effect upon

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mental health and happiness (Ali et al. 2016). Volunteering is a source of increased life satisfaction (Aydinli-Karakulak et al., 2016).

In general, Pro-social behavior has been studied in two broader views; short term, unplanned, spontaneous and beneficiary is a stranger. The other substantive view is long term, planned, continuous and beneficiary is family person or one who is affiliated to the person. However, volunteering is distinctive pro-social behavior which is planned and beneficiary is unfamiliar person (Penner, 2002). Furthermore, motives which spur people to volunteer are important to discover because the sustainability of humanity and society lies therein.

In volunteering process individualism and collectivism have been found to be vital because they identify that volunteers intentions. If volunteer is an individual than his volunteering may be career oriented and when volunteers are in a group their intention would divert to social ties and role identity (Finkelstein, 2010). Collectivism has been found to be stronger than the individualism as far as Altruistic motivation and social ties are concerned identity (Finkelstein, 2010). Individual's volunteering is career oriented whereas collectively volunteering is focused for identities and social ties.

Table 1: Classification of Motivation and Intention to Volunteering

Types of motivation	Intention Mood
Intrinsic motivation	Trigger
	Religion
Extrinsic motivation	Instrumental
	Social

Intrinsic motivation is inherent and is inseparable; there is no reason to perform an action which is spontaneous; from inner. Extrinsic motivation is conditional with some outcome to achieve; instrumental nature. High intrinsic and low extrinsic motivation towards volunteering is powerful in the absence of extrinsic rewards, as these rewards would definitely weaken the intrinsic volunteer motivation (Geiser et al., 2014). However, volunteers with intrinsic motivation are more likely to take part in specific volunteer activity. To develop accurate procedures for recruiting, developing and satisfying the volunteers, a deeper understanding of volunteer motivation is essential.

Literature Review

Individuals induced towards volunteering because of four main reasons which are also known as paths i.e. trigger, social, instrumental, spiritual (Neely et al., 2013). These paths identify about individual's decision process regarding entering into volunteerism. These intentions recognize the motives to achieve after or during volunteering. Furthermore, objective behind the volunteering would also illuminate the path to the opportunities and there time span to opt for volunteering.

Bradford et al. (2016) analyzed the volunteer path ways among young working individuals. In UK volunteering is a source of adding into the individual's identity and a source of capital in various means. They used semi structure interviews and focus groups for analyzing motives and pathways of individuals. They found that volunteering occurs contingently not as the planned career path. Furthermore it helps in developing skills and social and cultural connections which benefit them in future.

Sundar et al. (2016) have explored relationship among community participation factors and the adults with mobility impairments. They have used mixed method study design where semi

structured interviews were conducted to find out the theme and then national survey data was accessed to find out further details by the use of structured equation model (SEM). They found that people with mobility impairment also feel responsibility to participate in community and social activities where ever environment support system is available to them. Moreover, self-efficacy plays a major role in this regard.

Okun and Kim (2016) have explored that prosocial motivation whether pressure-based or pleasure based can develop a sense of purpose in life and its meaning to the adults volunteering. They have used regression analysis to predict how frequently volunteering develop purpose in life. They found that pressure based prosocial motivation can build a purpose in life to the young adults.

In this globalized world, corporations are responsible for economic, social and environmental sustainability (Seele & Lock, 2015). Corporate volunteering climate is creating an atmosphere to induce employees on volunteering at personal and corporate level, which may result in social change (Rodell et al., 2017). Wellbeing climate may be foster by both employee driven process and company driven process (Rodell et al., 2017).

Studies identify that religion, sense of responsibility and mood states are important motivating factors towards volunteering (Pozzi et al., 2014). Occurrence of volunteering is not on regular basis rather discrete so the moral obligation is a major component to motivate individuals (Harrison, 1995). Volunteerism and psychological sense of community can also escalate wellbeing among older age individuals (Pozzi et al., 2014).

Arguments are there regarding future goals of individuals that they differ from culture to culture. For instance, people in India are more focused towards self and financial stability whereas Americans focus upon exploring and leisure oriented (Gupta & Hershey, 2016). In contrary to this study, Aydinli-Karakulak et al. (2016) have successfully applied Western models of volunteering in Hong Kong. Structures of motivational antecedents for volunteering have been found invariant among different cultures i.e. China, USA, Turkey, Germany.

Volunteering intentions are necessary to determine earlier in order to categorize or/and match the tasks which will satisfy the volunteer. Finkelstein (2008) has used functional approach to volunteering process. Motivational differences among individuals can help in categories them and built upon the differences. To better respond the motives of volunteers, their intentions would help in identifying the task which would be suitable and satisfying them (Willems & Walk, 2013).

Human behavior is a major component while drafting policies, whether it is a profit organization or non-profit organization. In current study we propose to use fuzzy logic to predict the intensity of each path. Assessing volunteers' expectations at the induction stage can improve their retention. Determining the motivational mechanism required for volunteering is therefore crucial.

Research Methodology

Aristotelian logic is used in social science research, where the answer is yes or no. In contrast, fuzzy logic systems have truth values that fall between the range of numbers 0 and 1. Instead of using strict true-false membership in sets, this branch of reasoning uses degrees of membership.

Our perception regarding the world is filtered through our concept, where there is no sharp boundary e.g. tall, young. These concepts are vague (fuzzy) in nature. Fuzzy logic provides a systematic structure for fuzzy quantifiers, like low, medium, high. Fuzzy logic incorporates not only predicate logic but also probability theory, which is helpful in different types of convictions in one framework (Zadeh, 1983). The fuzzy logic framework has the potential to contemplate various concerns which exist in conventional techniques. Tah and Carr (1999) have used fuzzy logic to develop proposal for assessment of risk in construction project.

Fuzzy Logic System

Below are the steps followed to depict the proposed model.

Step 1: Four paths (Trigger, social, instrumental and religion) are selected as the key determinants of the volunteering intention.

Step 2: Both directions and the strength of the intention are given fuzzy sets. Fuzzy sets, such as low, medium, and high, are utilized to describe intensity in human language rather than numerical values. The membership function quantifies the degree of truth that each variable is a member of a given fuzzy collection.

Step 3: Inference rules entered in the system. A fuzzy hedge used to tweak the membership function according to the description of the inference rules.

Step 4: The trigger, social, instrumental, and religious networks are used to create the output fuzzy set of the volunteering intention. based on the norms of inference.

Figure 1: The figure shows the rule set which defines likelihood and severity of a given path with its magnitude value
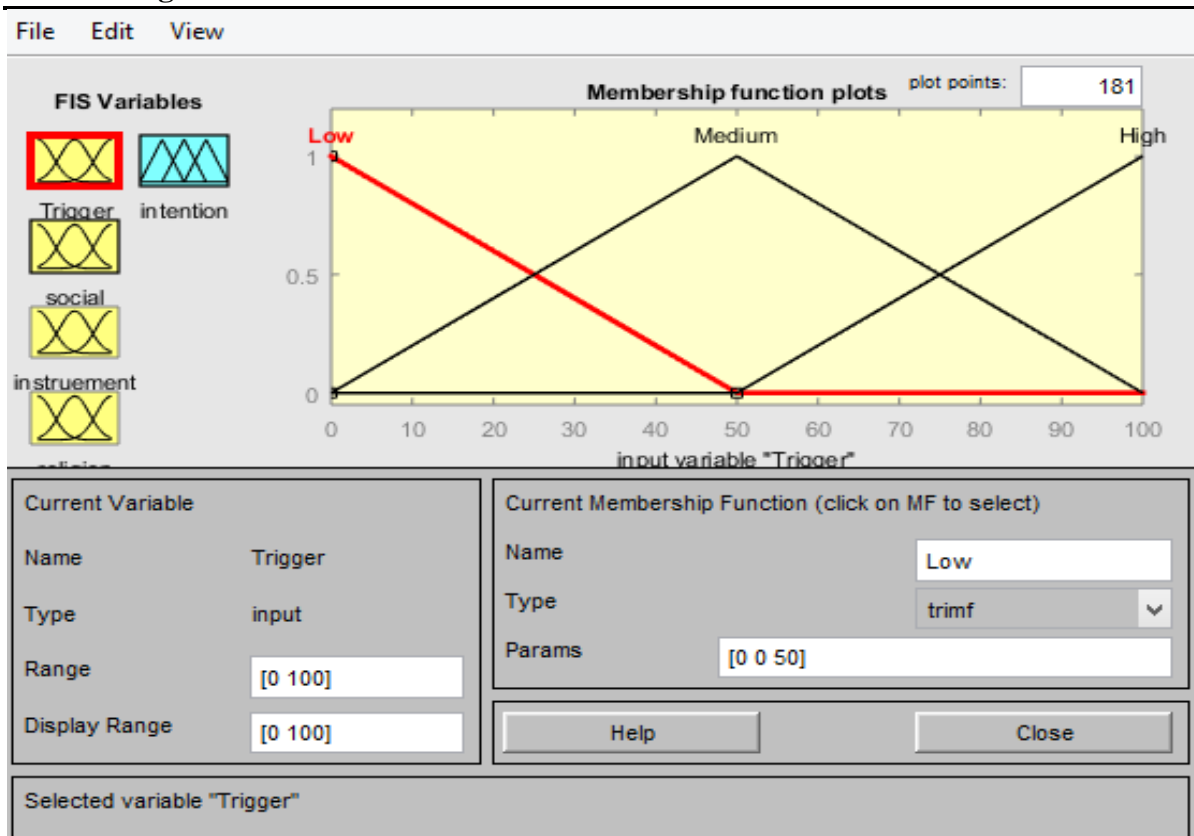
Note: The word low, medium and high represent the linguistic variables.

Figure 2: The figure shows membership function plots for intention
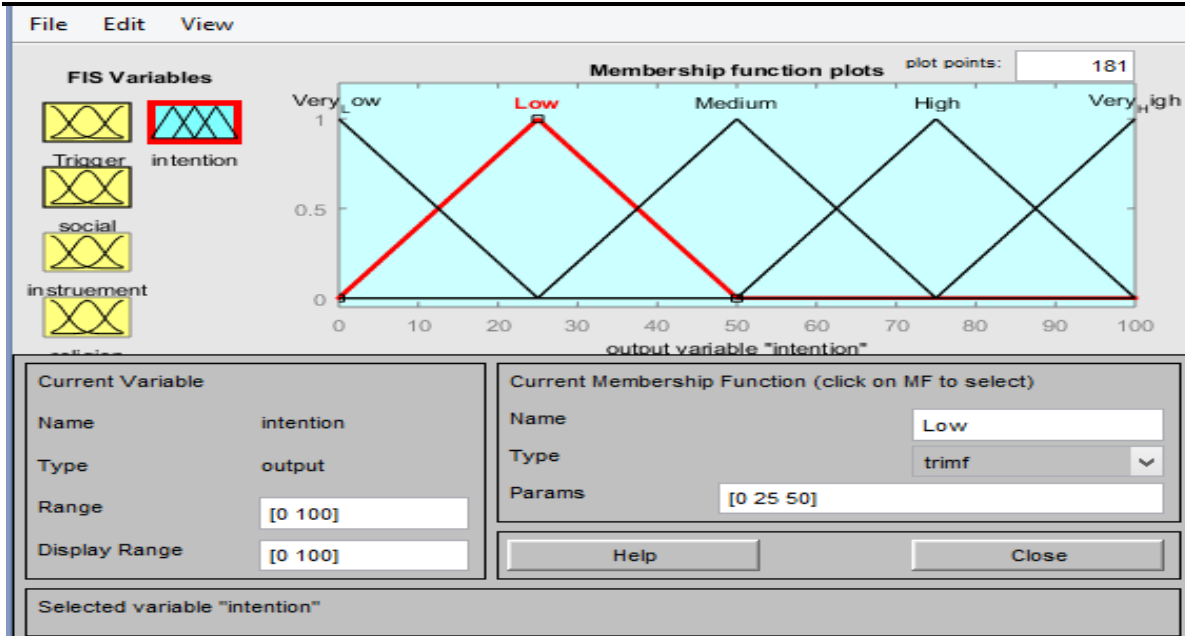
Note: Rule set have been defined in categories of very low (0-.25), low (0-.5,) medium (.25-.75) high (.5-1) very high (.75-1).

In fuzzy logic's, membership functions assign a degree of membership to each category, ranging from 0 (no membership) to 1 (full membership).

Figure 3: The figure shows the rule set in human language which defines likelihood and severity of a given path with its magnitude to the intention
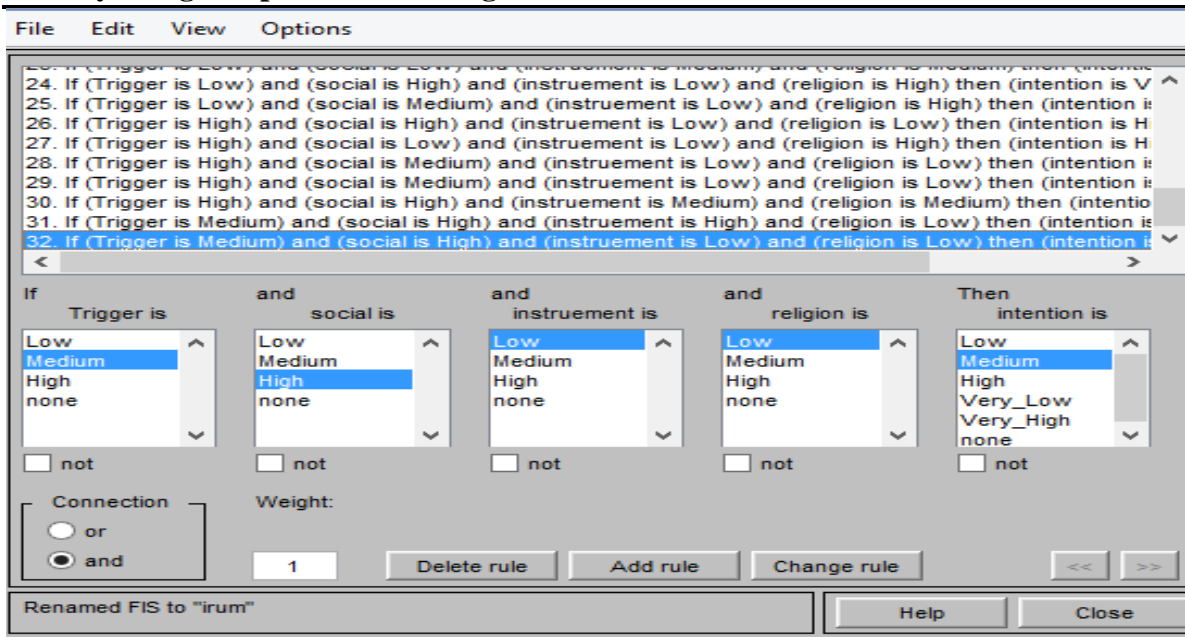
Figure 4: The figure shows the rule set in fuzzy logic form which defines likelihood and severity of a given path with its magnitude to the intention
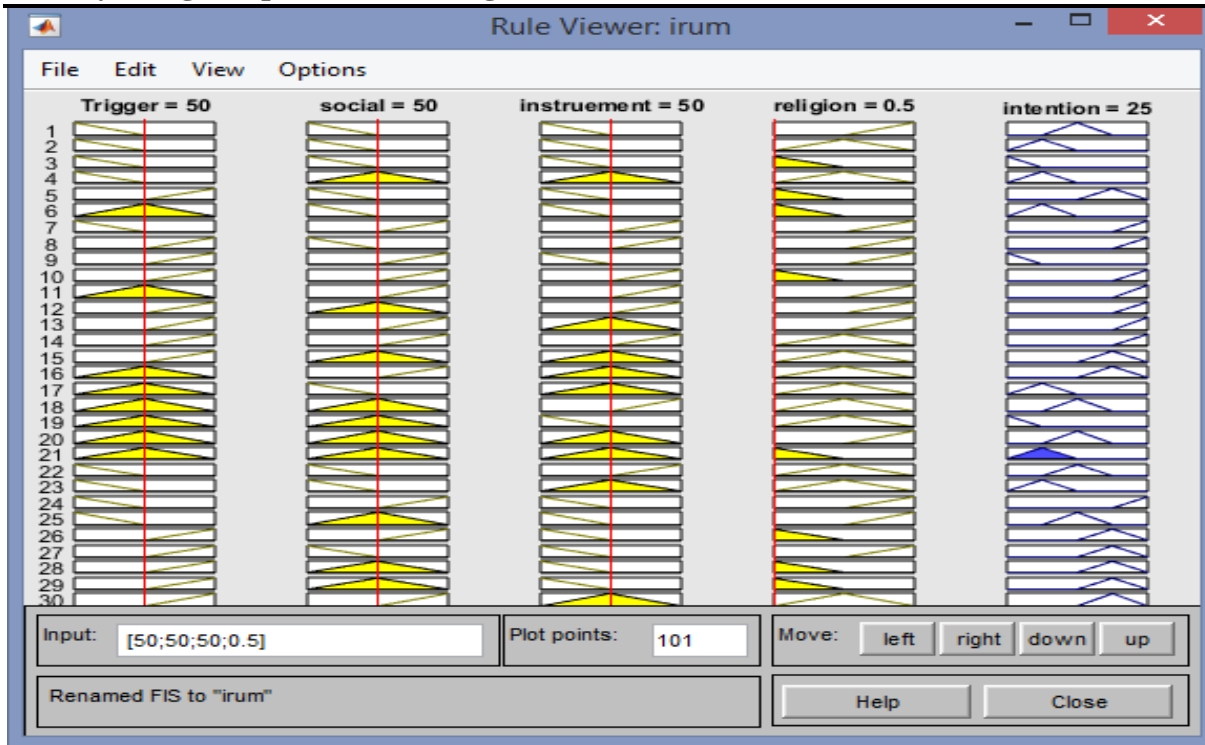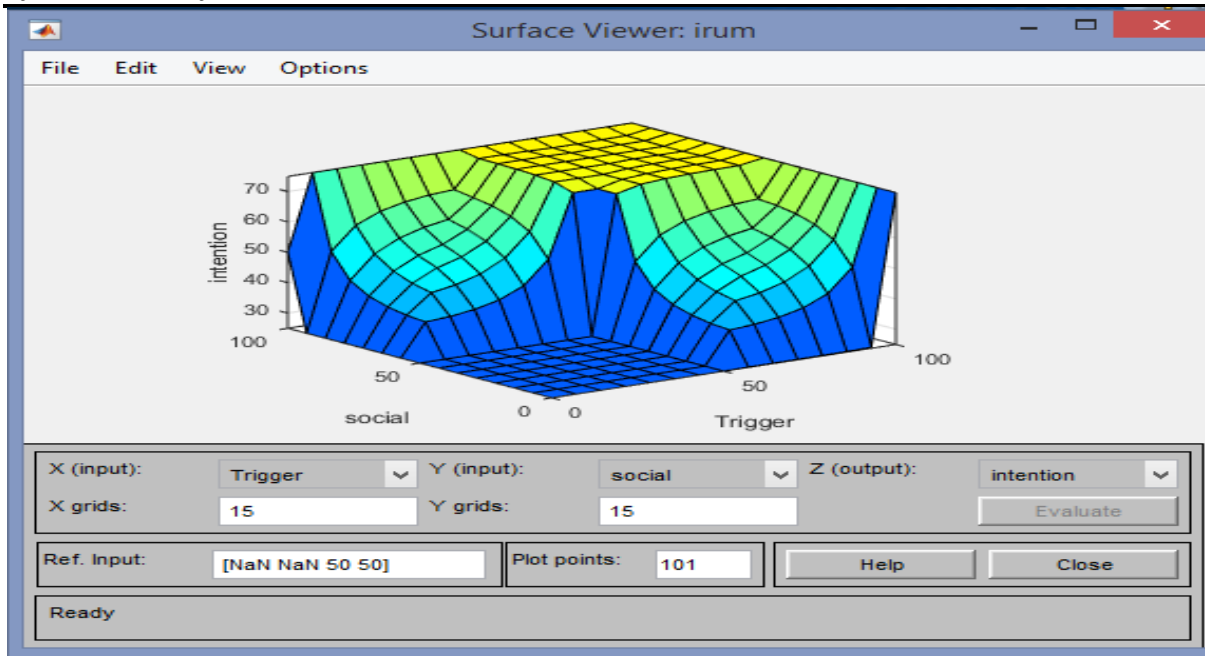

Figure 5: The figure displays the surface view of fuzzy logic and represents the rules in a symmetric way, which was inconvenient in traditional form

Results and Discussion

As seen in Figure 1 and 2, we can have five variable for volunteering motivation which have following analysis result (very high, high, medium, low & very low). The input value ranging from 0 to 1, which include the all the estimation of volunteering motivation starting very low until very high situation.

The figure 2 estimates membership function plots for intention where the values have been defined specific categories of very low (0-.25), low (0-.5,) medium (.25-.75) high (.5-1) very high(.75-1). The result of volunteering motivation in figure 4 and 5 respectively, which include the all the outcomes estimation starting very low until high circumstance like trigger, social, instrument, religion and intention where can divide specific values of trigger, social, instrument and intention are between (0-100) and the input of religion is lies between (0-1). The input value ranging 0 to 100, which include the analysis of volunteering motivation variables in percentage perspective. It is proposed that with fuzzy logic that volunteering intentions magnitudes can be explained by intrinsic motivation such that trigger and religion and for extrinsic volunteering motivation consisting instrumental and social intentions

Conclusion

In conclusion, the above fuzzy logic represents a picture of the intentions of volunteers and the paths. A four dimensional structure of volunteering intention has been proposed to facilitate in identifying the intention path and their combinations in respect to intensity for volunteering. The concepts of fuzzy association and fuzzy composition have been applied to identify relationships.

In the current study we explored the broad range of potential combinations of volunteer's motives to enter into volunteering, future studies can attempt to find proof for the combinations of intentions and the preferences. Hence, research on defuzzification in the same scenario would help to identify the error rate in this method. Consequently, the paths would be more refine and then would be able to implement in real time accurately.

Following the example of the present study, future studies examining volunteering and other prosocial behaviors should include intensity of the paths in combination as antecedent and test the motivational effects. Future research is needed to further refine the volunteer motives in relation with fuzzy logic to generate results which can be generalized on the whole population.

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