The Rational Decisions in Communities Affected by Annual Floods in East Java, Indonesia

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Abstract: A rational decision is a systematic and logical way of making a resolution. It is needed in critical situation, especially the unavoidable ones such as annual floods. People affected by this natural disaster, continue living their lives if good rational decisions are made. The current research consists of two studies. The first identifies rational decisions based on age, education, socio-economic and gender, while the second is based on decisions associated with resilience, coping strategies and age. A total number of 354 participants from various cities in East Java were used as participants of the study. The results in the first study, 58% of the people made good rational decisions, with the remaining 42% making low decisions. Furthermore, education was found to significantly influence the decision making process. The second study found a significant relationship between the resilience, coping strategies, age with the rational decisions. Conclusion of the study will be used make better decisions for the community in order to minimize physical and psychological impacts.

Keywords: *rational decisions; resilience; coping strategies; annual flood*

Introduction

Disaster is an unexpected event which usually leaves a huge adverse effect on people, both physically and psychologically such as annual flooding. The ability of communities to deal with disasters varies greatly. However, it comprises of their ability to think critically with the appropriate coping strategies and resilience capabilities. Unfortunately, research on community's thinking ability in terms of disaster is still very little, owing to the large concentration of studies on disasters aimed at mitigating and handling post-disaster in physical, emotional and behavioral characteristics. For example, a study conducted by Utomo and Supriharjo (2012) examined more on the identification and characteristics of hazard threat. Furthermore, Anwaruddin, Noviekayati, Saragih (2016) reported the resilience of flood victims; Yunida, Kumalawati, Arisanty (2017) was based on the impact of flooding on socio-economic community, while Marbaits, Noviekayati, and Meiyuntariningsih (2017) research was on giving group counseling to flood victims in Madura.

The concept of rational thinking in this study is based on comprehensive thinking from Lindblom (1965). A person makes rational decisions based on problems with values and goals,

and already has various alternative solutions. Decision making is actually not dealing with problems but making inappropriate decision on the root of the problem. According to Jordan, Brooks, Delisi, Gray, Berkowitz (2015), the rational thinking ability is a high-level understanding difficult for untrained individuals. Furthermore, it is useful in solving life's daily problems. Toplak, West, Stanovich (2014) reported that rational decisions result in individuals cognitive abilities through the developmental stage. This study analyzed the differences in individuals' cognitive abilities. The high-level thinking is often analogous to perception which is a very complicated event. According to Felin, Koenderink, Krueger (2016), all cognitive modeling, rationality, reasoning or decision making are based on the concept of perception. It depends on the ability of individuals to adapt to the environment, competencies possessed, maturity in processing information, behavioral and decision making. Therefore, someone's perception will affect the rationality or ability to make decisions.

This can be derived and studied (Glynn, Voinov, Shapiro, White, 2017). The way of thinking is very much influenced by its type, inherited habits, beliefs, and analytical concepts done repeatedly. In addition, it is also influenced by the number of groups and the current situation. Glynn, et al (2017) stated that there is a cogitative system of reasoning when humans think rationally. The first is based on a concept derived and developed into a second thought. The latter is related to the nature of consciousness also known as objectively. Similarly, Rappange, Brouwer, and Exel (2014) reported that decision making is highly dependent on demographic characteristics, health behavior, experience, and the amount of information possessed by individuals, which directs them to making a rational decision.

This research will lead to the decision theory and cognitive science. Both theories exist in the field of psychology and refer to the individual differences that rational thinking and response are on the continuum line. It can be interpreted that an individual will think and respond very rationally (Stanovich, West, Toplak, 2016). There is another meaning of rationality that follows in the category model. De Sousa, (2007) defines rationality as the concept of reasoning, where people who are unable to think in this way are referred to as having no reason. According to Etzioni (2014), rationality is a degree of thought or behavior from simple to complex as conceptualized in a normative model. In the cognitive science concept, if someone thinks or behaves less humanly then they are referred to as having "irrational thinking". In a disaster situation, the trauma is generally accompanied by psychological consequences. However, not all disaster situations results in trauma. This most times occurs in individuals with past memories similar to present experience (Goodall and Lee, 2015). In

addition, it can be caused by the selection process of alternative solutions in accordance with expectations, situations. The choice of alternative solutions is one product of rational decisions.

When traumatized, the individuals need adequate energy known as resilience in order to be free. With this, individuals become calmer (Sutcliffe & Vogus, 2003).In addition, the resilience is the ability to recover trauma and the capacity to provide the sustainable health and psychological well-being in facing further obstacles. It emphasizes the positive processes, norms and adaptations (Welsh, 2012). Similar to what Brick & Leckman (2013) reported resilience is a process of strengthening the biological, psychosocial, structural and cultural potentials to become prosperous. Age also affects the formation of resilience. The higher the age, the more complex the problems faced by individuals, thereby, leading to adaptability.

Coping is a constant cognitive and behavioral change to manage the external or internal demands valued as the potentials owned by individuals (Lazarus & Folkman, 1984). It is a dynamic process, not a trait. Trait is a settled character, while coping is a complex and variable attribute, which changes in accordance to demands. It is learned and not inherent. Trait is not an attempt to master a situation but to accept it (Forsythe, 2010).

Age is important as the more mature a person becomes, the higher their ability to solve problems. The higher the pressure or stress gained by an individual, the greater the effort to find a solution to the problem. (Aldwin, Skinner, Zimmer-Gembeck, Taylor, 2001; Welsh, 2012).

Annual flooding is an unexpected and unavoidable event that occurs in a community and region. The struggle formed in this society is strongly influenced by culture, personality and age. At a more mature age, individuals will have better coping. According to the Village Head of Iker-Iker and Ngablak (interviewed on 15 August 2018), people accepted the conditions even though the community suffered huge losses. Further stated that the flood would always come whenever the farm is ready for harvest. Therefore, it is very rare for people to enjoy the agricultural products or ponds properly. However, the community can only submit all existing conditions to the Creator and feel that there is no need to move from the current location as it is considered a place of residence with lots of fortune and hope.

According to Rappange, Brouwer and Exel (2014) in the research on rational decisions for healthy living, subjective life is at the age of 9-15 years, and amounts 57%. Subjects with higher socio-economic conditions, also have a better possibility of subjective life. A research conducted by Stanovich (2010) stated that younger individuals use their lives more freely with preference to smoking, gaining excessive weight, and free sex, believing that life is still very long and can be used unwisely.

Furthermore, the research conducted by Chen, Peng, Xu, O'Brien (2017) found that the higher the age, the more the tendency to use problem focused coping. When examined, it was realized that positive and negative emotion were linked to the age range of 18-89 years. As a result of this, when individuals make rational decisions with respect to annual floods, the community tend to accept misfortune. The research question is why do people tend to accept misfortune associated with resilience, coping strategy and age? What are the reasons behind it, when a community is trained to recover itself from the unpleasant events with clarity sets in?

Method

Participants

In the first study the participants are the community in Iker-Iker and Ngablak villages in Gresik regency; Kanor village in Kanor sub-district, Bojonegoro regency; Kalisari village in Baureno sub-district in Bojonegoro regency, Batokan village in Kasiman sub-district, Bojonegoro Regency; Banjarjo village in Padangan district, Bojonegoro regency. The Forum Group Discussion (FGD) participants were 60 people from 2 villages in Gresik district. The scale fillers were 200 people from 4 villages in Bojonegoro district.

While in the second study, comprises of one-hundred and fifty-four Indonesians realized through Google form search for 1 week (in September 2018), most of which are residents on East Java.

Measures

In the first study, the Rational Decision scale was compiled based on Glynn, Voinov, Shapiro, White (2017) theories. There are four aspects of rational decisions, namely bias, value, belief and heuristic with 36 valid items. The second study makes use of two measurement tools, namely the scale of resilience and coping strategies in addition to the rational decision scale.

The Resilience Measurement Tools are prepared based on Rutter's (1990) with 7 indicators namely (1): able to understand and give meaning to the situation, (2) able to be assertive and have a positive and optimistic orientation in the future, (3) ability to develop honest, supportive and qualified life, (4) have a strong desire to change lives for the better, (5) able to think of various choices, consequences, and alternatives in facing life challenges, (6) able to see the bright side of life, laugh at oneself, and find happiness in any situation, (7) able to behave on the basis of conscience to live well and productively.

The coping strategy measurement tool is prepared based on the theory of Lazarus (1993). It uses 8 indicators namely (1) confrontative coping, (2) distancing, (3) self-controlling, (4) seeking social support, (5) accepting responsibility, (6) escape-avoidance, (7) problem solving, (8) positive reappraisal.

Statistical Analyses

The procedure statistics analyzed data in two stages. The first stage was in study 1 using three instruments, namely rational decision, resilience and copying strategy on 200 subjects. The results of this statistical analysis were validation and reliability of the three instruments using with descriptive analyzes (Table 1). The second stage in study 2 with validated instruments was applying to 154 subjects using Pearson Correlation analyzes (Table 2).

1. Table: 1: Reability and Validity Questionnaires

Data Analysis (Cronbach's Alpha)	**Reability**	**Validity**
Study 1: Rational Decision Scale	0,943	0,332 - 0,679
Study 2:		
a. Rational Decision Scale	0,934	0,399 – 0,677
b. Resilience Scale	0,928	0,399 – 0,767
c. Coping Strategy Scale	0,885	0,271 – 0,683

2. Table 2: Pearson Correlation of Rational Decisions

Variable	**R**	**Sig**
Resilience	0.594	0.000
Coping strategy	0.621	0.000
Age	0.229	0.002

Results

Based on the Table 3, it could be seen that in study 1, 58% of the community make good rational decisions, with the remaining 42% having medium to low rates which requires intervention in order to improve the community knowledge.

3. Table: 3: Rational Decisions by the community Affected by Annual Flood

Level of Rational Decision	**N**	**%**
Very high	15	7,5 %
High	101	50,5 %
Medium	53	26,5 %
Low	29	14,5 %
Very Low	2	1 %

Furthermore, in the study 2, the researcher connected the rational decisions with the resilience, coping strategy and age. The result showed differences between these three aspects. The older individuals showed a better rational decisions, resilience and strategy coping than the younger ones. The age group of 46-50 has a high mean value on rational decisions and resilience, while those of 31-35 have high mean value on coping strategy (table 4).

4. Table 4: Resilience, Coping Strategy, Rational Decisions and Age

	Age	N	Mean
Rational Decision	19-22	49	217.3061
	23-25	32	252.7813
	26-30	41	260.4390
	31-35	14	286.3571
	36-40	9	244.8889
	41-45	3	235.0000
	46-50	**4**	**290.5000**
	51-60	2	218.0000
	Total	154	246.3052
Resilience	19-22	49	103.9592
	23-25	32	123.9688
	26-30	41	122.6098
	31-35	14	130.4286
	36-40	9	128.5556
	41-45	3	131.0000
	46-50	**4**	**143.0000**
	51-60	2	101.5000
	Total	154	118.4351
Coping strategy	19-22	49	122.4286
	23-25	32	141.4375
	26-30	41	148.4634
	31-35	**14**	**160.2857**
	36-40	9	147.2222
	41-45	3	147.0000
	46-50	4	156.5000
	51-60	2	137.5000
	Total	154	139.7597

Discussion

Based on the results of the previous analysis, it could be reported that some residence of East Java were able to make rational decisions on the annual floods experienced by adapting to the existing situation. The forms of adaptation are by raising the foundation of the house, putting valuables in a safe place (based on the results of the interview on August 15, 2018 with the head of the Iker-Iker village and Ngablak Gresik village in East Java).

As mentioned in the comprehensive theory (Lindblom, 1965; Etzioni, 2014), a rational decision maker has enough information on the various alternative solutions, thereby, making it possible to predict exact consequences of alternative choices, and take into account the cost benefit principle and consider many interrelated problems. Individuals who are able to make rational decisions are able to distinguish one problem from another. In addition, goals for decisions were made rationally owing to the various alternative solutions to problems.

Age depicts an individual's capability in adapting to problems. The more mature a person is the better in solving problems. Similarly, the higher the pressure or stress gained by that individual, the greater the effort to find a solution to the problem. The more mentally healthy a person is also reflects the effort in forming coping (Aldwin, Skinner, Zimmer-Gembeck, Taylor, 2001). It can be seen in table 2 that those in the 46-50 age group make best rational decisions. This shows that this age group is the most productive and experienced in solving problems. This study also supports the research conducted by Toplak, West and Stanovich (2014) which states that the development of cognitive abilities is in line with the stages of individual. The development stage of the 46-50 age group is the final adult age group before retirement. So the decision making becomes good because of mature cognitive abilities.

The group also has the highest resilience which shows that life experiences in dealing with various problems causing them to overcome the trauma experienced during annual floods (Welsh, 2012). In this age group, individuals have achieved their welfare making it easy for them to quickly adapt to unexpected situations.

Furthermore, the coping strategies owned by the age group 31-35 are Problem Focused Coping. In the event of an annual flood disaster, the ability to display comfortable behavior by finding the best solution is in this age group. This happens because this age group is classified as an early adult group towards middle school, whose job is to find comfort in their lives now and in the future. Therefore there is the desire to find solutions to problems compared to other age groups (Chen, Peng, Xu, O'Brien, 2017).

Conflicts of interest

The authors declare no conflicts of interest.

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