APPLICATION OF ANALYTICAL HIERARCHY PROCESS IN THE SELECTION OF MARRIAGE PARTNER

Onosemuode Edesiri Kelvin

Department of Mathematics and Statistics, Akanu Ibiam Federal Polytechnic, Unwana

edesirikelvin1@gmail.com

Abstract

One of the critical stages in the life of the individual is when a young male or female has come of age and he or she needs a partner to live the rest of his or her life with. Choosing the right partner is not as easy as one thinks. There are a lot of fears of how the marriage will end up if the wrong choice is made. So, intending couple are always careful when it comes to this stage of life. Analytical hierarchy process (AHP) has been a vital tool in decision making under uncertainty in every field of life. It is a tool in decision making that ensures that all relevant factors are considered. It also allows for the evaluation of options based on multiple criteria that reflect real-life situation that are complex. Though uncertainty is inevitable as far as life is concerned, but it can be reduced once the right judgment is made based on available information. In this research, a critical judgment and conclusion which will be of help for the lady to decide were made. From table 5 above, the right choice for the lady according to the judgment of the panel is Lucky whose priority is 0.499. Without any doubt, if the lady should go for John, she will definitely have unsettled home in future if peradventure she produces children with the sickle cell gene which is one of her fears. Thought she loves John more than Lucky, she can easily develop love for Lucky as time goes on. With the decision of the panel most fears and confusion of the lady have been drastically reduced.

Keywords: Decision under certainty, Decision under uncertainty, Marriage partner selection, Analytical Hierarchy Process

Introduction

Under conditions of certainty, exact, accurate, measurable and reliable information and knowledge on which you base your decisions are very much available before you. The cause-and-effect relationships are known. The future and outcome are highly predictable under certainty conditions. One way an agent would be in a decision situation under certainty is if the agent has full control over the required state. With this control of the agent, the process of deciding between two alternatives will lead to refinements in both attribute estimations and degree of certainty in those estimates (Douglas, 2022). A condition of certainty could also mean a situation when you know with reasonable certainty what the alternatives are, what conditions are associated with each alternative and the outcome of each alternative. According to Douglas (2020), even most contemporary models of value-based decisions are built on values estimates that are typically self-reported by the decision maker. This shows that there will be some element of biasness in result of such decision.

Decision under uncertainty is a situation whereby the decision maker do not have any information about the outcome. There are many unknowns. Nobody knows what will happen. There is no possibility of knowing what could happen in the nearest future to alter the outcome of your decision. Uncertainty is a key contextual factor that affects the decision-making of multinational corporations on many types of international operation (Sniazhko, 2019). Decision making under uncertainty could also be viewed as a situation where choosing an option can lead to several mutually exclusive outcomes and the decision maker cannot know beforehand which of these possible outcomes will in fact be the result of his or her choice. In order to make an effective decision under uncertainty, the decision maker has to be rational. Rationality requires that we gather information and learn about the environment ourselves and our future selves included (Itzhak, 2009).

According to Thom, et al (2023), Aleatoric uncertainty as a type of uncertainty is irreducible in the sense that is not realistically possible (what is realistic may boil down to a philosophical debate). From their work, model to reduce the level of uncertainty was developed using Markov chain model and this reduces the fear associated with the decision made in the problem with which the model was apply to. Due to the fear of the unknown that associated with decision taking under uncertainty, Manali (2022) suggests that the virtue of prudence is aptly suited to the particular demands of such decision making.

Uncertainty in the choice of who to marry

There are a lot of uncertainties. There are a lot of fears when one is trying to decide who he or she will marry. These fears might be as a result of unpredictable human behaviour. Individuals have the tendency of changing over time, and their behaviours, values and goals may evolve in unexpected manners.

Some broken courtships over the years were as a result of the inability of either partner to cope with certain characters of the person they intended to marry. They say "it is better to break a relationship than to break a marriage". This saying following with the breakage of many relationships was as a result of unforeseen behaviour in the life of one of the intending couple which the other partner could not tolerate.

Uncertainty in the issue of who to marry originated with the creation of mankind. After God created everything He discovered and said that there was not found an help meet for Adam in (Genesis 2:20). And it is this phrase "not found a help meet" that is causing anxiety and fear for intending couple. So, since creation man has been looking for the partner who will be an "help meet" for him. Likewise the woman that is looking for a man to marry

The fact is that there is no two individual that can be compactable even among identical twins. But there are levels of tolerance one can take in any sincere relationship that will lead to marriage. So, to reduce uncertainty during marriage is for someone to carefully choose a partner with those characters that are manageable and will not pose treat to his or her marriage in the future. Marital success requires a high level of compatibilities of a potential marriage partner which is not easily obtainable (Sevket, 2002). We are supposed to make a choice following our emotions, but there is no institution that regulates and organizes this process and emotions are not always as clear and stale as one may wish (Carolina et al, 2022).

Analytic hierarchy process (AHP) in decision making

Linear programming model is a model used in decision making under certainty, that is, all the data are known with certainty. Analytic Hierarchy Process (AHP) is process well designed for situations whereby feelings, emotions and ideas affecting the decision process are quantified to provide a numeric scale for prioritizing the alternatives (Hamdy, 2011). The Analytical Hierarchy Process (AHP), is one of the multi-criteria decision-making methods that divides a complex decision problem into different hierarchical level (Avtandil, et al, 2023). It can help you make informed, rational and consistent decisions that align with your goals and values, since there are always a lot of confusions as far as decision-making in personal life is concern (Jour, Rajani & Jawahar, 2017). The hybrid method of Analytic hierarch process and technique for order preference and similarity to ideal solution has been used to calculate the importance of each criterion which is identified through literature review and field survey and rank the alternatives (candidate profile) has been adopted by the Indian government in choosing their partner especially for female (Ankur & Parveen, 2021).

The HPS uses the following steps to arrive at its solution

1. The goal of the research, which for this case is the choice of who to marry by a 24 year old lady.
2. Alternatives: these are the different men that are interested in marrying the lady and they include John, Lucky and Rex.

3. Criteria: these are the characteristics of the Alternatives that are to be measured. For the purpose of this research, these characteristics include level of education of the alternatives, their job status, their genotype and how much they love this lady.

As the decision makers continue with the Analytical Hierarchy Process (AHP), they will determine priorities for the alternatives with respect to each of the decision criteria, and priorities for each of the criteria with respect to their importance in reaching the goal.

Priorities will then be combined throughout the Hierarchy to give an overall priority for each alternative. The alternative with the highest priority will be the most suitable alternative, and the ratios of the alternative priorities will indicate their relative strength with respect to the goal.

The Analytical Hierarchy Process (AHP), fundamental scale will be used in assigning the weight. The scale is shown I table 1 below.

Table1: The Fundamental Scale for Pairwise Comparisons

Intensity of Importance	Definition	Explanation
1	Equal importance	Two elements contribute equally to the objective
3	Moderate Importance	Experience and judgment moderately favour one element over another
5	Strong Importance	Experience and judgment strongly favour one element over another
7	Very Strong Importance	one element is favoured very strongly over another, its dominance is demonstrated in practice.
9	Extreme Importance	The evidence favouring one element over another is of the highest possible order of affirmation

Intensities of 2, 4, 6 and 8 con be used to express intermediate values. Intensities of 1.1, 1.2, 1.3, e.t.c can be used for elements that are very closed in importance.

The Analysis of the Problem Using the Analytical Hierarchy Process (AHP)

In this research work, information was generated through personal interview with the lady. And this was possible due to personal relationship of the researcher with the lady who really needs some advice on who to marry among three young men. For the sake of confidentiality, real names of all those used in this were deliberately not used.

Below are the variable used in this Analysis

1. Goal: the goal of this research is to advice the lady on who to marry among the three young men that are seeking her hand for marriage, based on the outcome of our judgment.
2. Criteria: the criteria are those areas of major concern to the lady that the panel will critically look into and upon which judgment will be made. And these areas include: Education, Job, Love and Genotype.
3. Alternatives: the alternatives are the three young men who want to marry the lady. To them I named John, Luck and Rex.

Some extracted information upon which judgments were made

1. the lady is a master degree holder, her genotype is AS
2. John is a master degree holder, and his genotype is AA, but his parents' genotype are both AS
3. Lucky has Bachelor in Science, his genotype is AA, and that of his parents are both AA
4. Rex has an HND certificate, and his genotype is AA, but the mother's genotype is AS, while that of the Father is AA.

A three man panel with experience in various field of life was constituted by the researcher to determine the priorities for the alternatives with respect to each of the decision criteria, and priorities for each of the criteria with respect to their importance in reaching the goal. The members of the panel include a male lecturer who is an expert in population genetics, a male lecturer who is a pastor and also a marriage counselor and one female psychologist.

The priorities will then be combined throughout the hierarchy to give an overall priority for each alternative. The alternative with the highest priority will be the most suitable, and the ratios of the alternatives' priorities will indicate their relative strength with respect to the goal.

Table2. Alternatives compare with respect to education

Alt.				Judgment
J	3	L	1	The lady is a master degree holder, and she needs someone who has a degree not lower than either a B.Sc. or an HND. John is a Master Degree holder while Lucky is a B.Sc. holder, John is therefore moderately preferred with weight of 3.
J	7	R	1	Rex is an HND holder, with John's certificate, he is very strongly preferred to Rex with weight of 7
L	1.3	R	1.2	Lucky and Re are having and equivalent certificate, from the interview, the lady prefer B.Sc. to HND, though she didn't take it as an enough reason for her overall choice. Since the two certificate very close in important, Lucky is therefore preferred to Rex with weight of 1.3

The next step of the process is to transfer the weights to a matrix, using method unique to the Analytic Hierarchy Process (AHP). For each pairwise comparison, the number representing te

greater weight is transferred to the box of the corresponding alternative, while the reciprocal of that number is put on the box opposite the number along the diagonal. With this process, table 2 below is generated.

Table3. Matrix with the various weight of Alternatives compare with respect to education

	John	Lucky	Rex	Priority
John	1	3	7	0.686
Lucky	1/3	1	13/10	0.192
Rex	1/7	10/13	1	0.122
				1.000

The priorities in table 3 above are generated by first summing each column of the reciprocal matrix, thereafter we divide each element of the matrix with the sum of each column and finally, we take the average across the rows. The normalized principal Eigen vector is also called priority vector. Since it is normalized, the sum of all elements in the priority is 1. The priority vector shows the relative weights among the characteristics we compared. Other priorities were gotten in the same way.

Table4. Alternatives compare with respect to Job

Alt.				Judgment
J	1	L	7	Lucky has a stable job, while John though working, has not gotten the job of his choice, Lucky is very strongly preferred to John with weight of 7.
J	1	R	5	Rex is working in an oil company though as a contractor , he is strongly preferred to John who is still seriously searching for a job, with weight of 5
L	3	R	1	Lucky and Rex are both working, but Lucky is moderately preferred to Rex, because there is no job security in a contract job. The weight is therefore 3.

Table5. Matrix with the various weight of Alternatives compare with respect to Job

	John	Lucky	Rex	Priority
John	1	1/7	1/5	0.074
Lucky	7	1	3	0.643
Rex	5	1/3	1	0.283

				1.000

Table 6. Alternatives compare with respect to Genotype

Alt.				Judgment
J	1	L	5	The lady's genotype is AS. John's genotype is AA but the parents are both AS. Lucky's genotype is perfectly AA. That is, his parents are all AA. Lucky is therefore strongly preferred to John with weight of 5.
J	1	R	3	John and Rex are both AA, but John's parents genotype is AS, and Rex's mother genotype is AS while the father's is AA, Rex is therefore moderately preferred to John with weight of 3.
L	3	R	1	Lucky and Rex are both AA, but Lucky is moderately preferred to Rex with weight of 3, because of Rex mother's genotype which is AS.

Table 7.Matrix with the various weight of Alternatives compare with respect to Genotype

	John	Lucky	Rex	Priority
John	1	1/5	1/3	0.106
Lucky	5	1	3	0.633
Rex	3	1/3	1	0.261
				1.000

Table 8 .Alternatives compare with respect to Love

Alt.				Judgment
J	5	L	1	The lady loves John more than Lucky, so we can judge that John is strongly preferred to Lucky with weight of 5.
J	5	R	1	The lady loves John more than Rex, so we can judge that John is strongly preferred to Rex with weight of 5.

L	1	R	3	From our discussion, the lady moderately loves Rex more than Lucky. Rex is therefore moderately preferred with the weight of 3.

Table 9.Matrix with the various weight of Alternatives compare with respect to Love

	John	Lucky	Rex	Priority
John	1	5	5	0.686
Lucky	1/5	1	1/3	0.102
Rex	1/5	3	1	0.212
				1.000

Table 10.Criterion compare with respect to the Goal

Alt.				Judgment
E	1	J	3	Though education is important, it shouldn't be a strong reason for the lady to make a choice among the options available to her . So, job is moderately preferred to education with weight of 3.
E	1	L	5	Once there is loves, the man with B.Sc. or HND can easily improve on himself to meet up with lady's standard of education. So, love is strongly preferred to education with weight of 5.
E	1	G	9	The lady with genotype AS, must extremely prefers AA genotype to education. This will carry the weight of 9.
J	1	L	7	Love is strongly prefers to job. Any marriage based on job will not last if the job is gone. But love can sustain any marriage even when there is no Job. So love is strongly prefer to job with a weight of 7
J	1	G	9	To this lady, genotype is extremely prefers to job. It is the person that has life that can work. The weight associated with this is 9
G	9	L	1	The problems that go with couple having AS are so great that it will take a man of high faith to handle. So genotype is extremely prefers to love with weight of 9

Table 11.Matrix with the various weight of Criteria compared with respect to the Goal

	Edu.	Job	Love	Genotype	Priorities
Education	1	1/3	1/5	1/9	0.044
Job	3	1	1/7	1/9	0.080

Love	5	7	1	1/9	0.215
Genotype	9	9	9	1	0.661
					1.000

Tale 12.Priorities with respect to Criterion and Goal

Criterion vs Goal		Alternatives	A		B	C
Education	0.044	John	0.686	*	0.044=	0.030
		Lucky	0.192	*	0.044=	0.008
		Rex	0.122	*	0.044=	0.005
			1.000			**0.043**
Job	0.080	John	0.074	*	0.080=	0.006
		Lucky	0.643	*	0.080=	0.051
		Rex	0.283	*	0.080=	0.023
			1.000			**0.080**
Love	0.215	John	0.686	*	0.215=	0.147
		Lucky	0.102	*	0.215=	0.022
		Rex	0.212	*	0.215=	0.046
			1.000			**0.215**
Genotype	0.661	John	0.106	*	0.661=	0.070
		Lucky	0.633	*	0.661=	0.418
		Rex	0.261	*	0.661=	0.173
			1.000			**0.661**

Tale `12.**Priorities With Respect To Education, Job, Love and Genotype**

	Education	**Job**	**Love**	**Genotype**	**Goal**
Alternatives					
John	0.030	0.007	0.147	0.070	**0.254**
Lucky	0.008	0.051	0.022	0.418	**0.499**
Rex	0.005	0.023	0.046	0.173	**0.247**
Total	**0.043**	**0.081**	**0.215**	**0.661**	**1.000**

Conclusion

Analytic hierarchy process (AHP) has been a vital tool in decision making under situation of uncertainty in every field of life. Though uncertainty is inevitable as far as life is concern, but it can be reduced once the right judgment is made based on available information. From table 5 above, the right choice for the lady according to the judgment of the panel is Lucky whose priority is 0.499. But comparing the education priority of Lucky with that of John, Lucky scored lower than John. Also, the lady loves John more than Lucky. What gave Lucky edge over John is the stable job he acquired and his genotype. Even though the lady loves John more than Lucky, the fear of having children that might have gene of the sickle cell anemia and they later becoming sicklier in future has been her major concern. Love can be developed with time. And this is the

variable among the other options that the lady can easily handle. Significantly, this study will greatly help in reducing uncertainty when trying to make a choice of who to marry. This will be possible if the right judgment is made by experienced professionals in the area of marriage.

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