

# SINGLE PARENTS AND THEIR DIFFICULTIES - AN ANALYSIS USING COMBINED INDUCED FUZZY COGNITIVE MAPS

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## Abstract

At present, single parenting prevail in this world due to various reasons such as death of spouse, divorce, adoption and so on. The challenge faced by them in bringing up these children are entirely different. Normal parenting and single parenting differ from each other due to different situations. The end result in growth of children also shows lots of variation in single parenting when compared to normal parenting. Fuzzy in mathematics helps us to deal with real life situations. Fuzzy models deals with unsupervised data. It has a wide applications in many areas of research. A fuzzy model, Combined IFCMs and its methodology is used to work on the difficulties experienced by the single parenting personally and also in bringing up their children.

## AMS Subject Classification:

**Key Words and Phrases:** FCM, Hidden Pattern, Single-Parenting, CFCM, IFCM

## 1 Introduction

The efforts taken by single parents to bring up their children is harder than the efforts put in normal parenting. The emotional challenges underwent by both single parents and their children appear to be different to express in words. It is said that major portion of growth and development taken place in the early part of the childhood. Parents play a role model for the children. In case of single parenting one can imagine the situation. The single parent cannot be living a happy and content life. He / She is living in a depressed and of mind. For the child that has lost the opportunity of getting the love and care from one parent, definitely lives in a deprived status. If the child is a girl, the problem becomes still more complicated as she grows and seek a person for matrimony. In India, in most of the normal middle class and low middle class families the children are entrusted with the mother at times of divorce. Only in rich families, the children are entrusted with mother or father. The problem faced by both the single parent as well as the child differ from families of different socio, economic and cultural background. In this paper an attempt is made to study the difficulties underwent by single parents and their children in Chennai city by taking samples from middle and lower middle class families.(4,5)

## 2 Hidden pattern of IFCMS

**Step-1** Collect the attributes of the problem

**Step-2** Obtain the directed graph

**Step-3** Construct the connection matrix

**Step-4** Obtain the resultant vector by passing the instantaneous state vector to the connection matrix

**Step-5** Each component of the resultant vector is then passed into the connection matrix. The vector with highest counting of one's is then considered as next resultant vector.

**Step-6** The process is carried out until fixed point is obtained.  
(2,3)

### 3 An Analysis of the Study

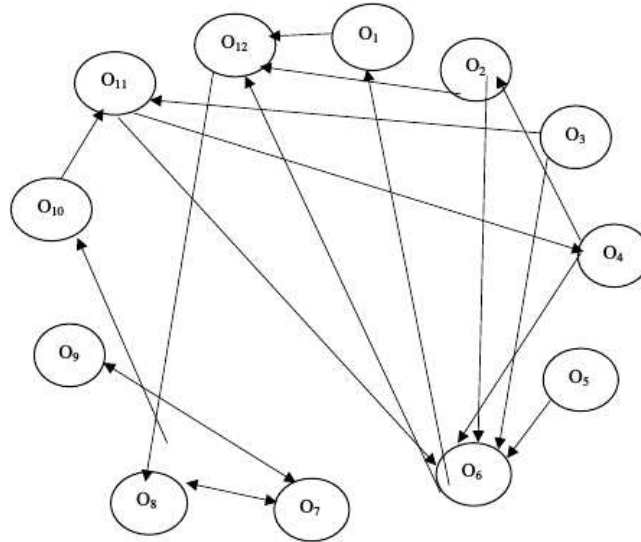
On interviewing the single parent of both genders, we collected their thoughts and problems that they faced as attributes and listed few for this study. The existence of uncertainty in each person’s thoughts and opinions made us to choose fuzzy models to study the problem that works on using unsupervised data.

- $O_1$  - Low income
- $O_2$  - Stress
- $O_3$  - Guilty
- $O_4$  - Not able to answer the questions raised by the children on their family life.
- $O_5$  - Increase in sexual interest
- $O_6$  - Decline in health
- $O_7$  - Children become independent and hard working.
- $O_8$  - Children suffer emotional behaviour problems.
- $O_9$  - Decision making done by the children
- $O_{10}$  - Children behave naughty / disobedient.
- $O_{11}$  - Inferiority complex developed by the mother
- $O_{12}$  - Undisciplined life by deserted father.

Analysis based on the opinion of First expert:

$O_1 \ O_2 \ O_3 \ O_4 \ O_5 \ O_6 \ O_7 \ O_8 \ O_9 \ O_{10} \ O_{11} \ O_{12}$

$$A = \begin{matrix} & \begin{matrix} O_1 & O_2 & O_3 & O_4 & O_5 & O_6 & O_7 & O_8 & O_9 & O_{10} & O_{11} & O_{12} \end{matrix} \\ \begin{matrix} O_1 \\ O_2 \\ O_3 \\ O_4 \\ O_5 \\ O_6 \\ O_7 \\ O_8 \\ O_9 \\ O_{10} \\ O_{11} \\ O_{12} \end{matrix} & \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \end{bmatrix} \end{matrix}$$



Process 1:

Let  $S_1 = (010000000000)$

$S_1A \rightarrow (010001000001) = S_1^1$

$S_1^1A = (010001000001) \times A$

$S_1^1A \approx (010000000000) \times A$

$\rightarrow (000001000001)$

$= (000001000000) \times A \rightarrow (100000000001)$

$= (000000000001) \times A \rightarrow (000000010000)$

Consider  $S_2 = (100000000001)$

$S_2A \rightarrow (110000000001) = S_2^1$

$S_2^1A = (110001000001) \times A$

$S_2^1E \approx (010000000000) \times A$

$\rightarrow (100000000001)$

$= (100000000000) \times A \rightarrow (000000000001)$

$= (000000000001) \times A \rightarrow (000000001000)$

Consider  $S_3 = (000000000001)$

$$\begin{aligned}
S_3 A &\longrightarrow (010000000001) = S_3^1 \\
S_3^1 A &= (010000000001) \times A \\
S_3^1 A &\approx (010000000000) \times A \\
&\longrightarrow (000000000001) \\
&= (000000000001) \times A \longrightarrow (000000001000)
\end{aligned}$$

Consider  $S_4 = (000000001000)$

$$\begin{aligned}
S_4 A &\longrightarrow (010000100000) = S_4^1 \\
S_4^1 A &= (010000100000) \times A \\
S_4^1 E &\approx (010000000000) \times A \\
&\longrightarrow (000000100000) \\
&= (000000100000) \times A \longrightarrow (000000011000)
\end{aligned}$$

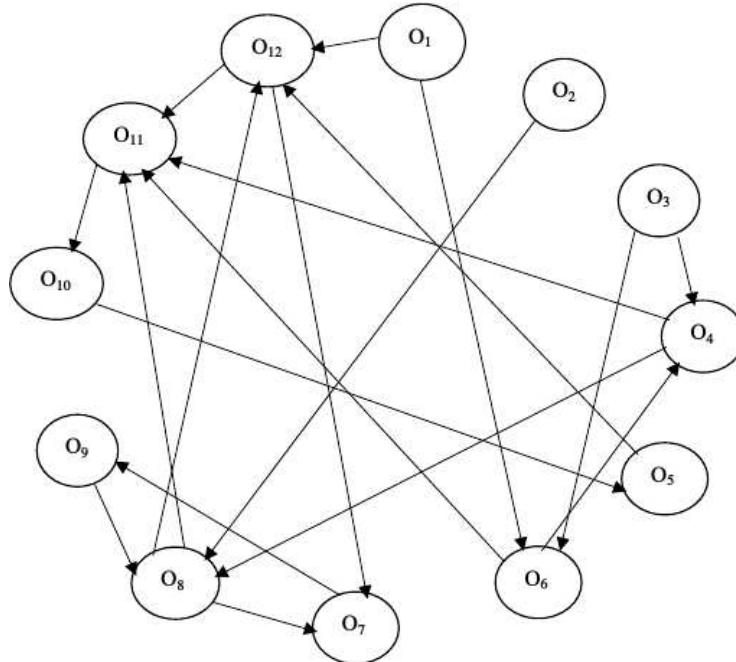
Consider  $S_5 = (000000011000)$

$$\begin{aligned}
S_5 A &\longrightarrow (010000100101) = S_5^1 \\
S_5^1 A &= (010000100101) \times A \\
S_5^1 A &\approx (010000000000) \times A \\
&\longrightarrow (000000100101) \\
&= (000000100000) \times A \longrightarrow (000000011000) \\
&= (000000000100) \times A \longrightarrow (000000000010) \\
&= (000000000001) \times A \longrightarrow (000000010000)
\end{aligned}$$

Therefore  $S_6 = (000000011000) = S_5$

Analysis based on the opinion of Second expert:

	O <sub>1</sub>	O <sub>2</sub>	O <sub>3</sub>	O <sub>4</sub>	O <sub>5</sub>	O <sub>6</sub>	O <sub>7</sub>	O <sub>8</sub>	O <sub>9</sub>	O <sub>10</sub>	O <sub>11</sub>	O <sub>12</sub>
O <sub>1</sub>	0	0	0	0	0	1	0	0	0	0	0	1
O <sub>2</sub>	0	0	0	0	0	0	0	1	0	0	0	0
O <sub>3</sub>	0	0	0	1	0	1	0	0	0	0	0	0
O <sub>4</sub>	0	0	0	0	0	0	0	1	0	0	1	0
O <sub>5</sub>	0	0	0	0	0	0	0	0	0	0	0	1
O <sub>6</sub>	0	0	0	1	0	0	0	0	0	0	1	0
O <sub>7</sub>	0	0	0	0	0	0	0	0	1	0	0	0
O <sub>8</sub>	0	0	0	0	0	0	1	0	0	0	1	1
O <sub>9</sub>	0	0	0	0	0	0	0	1	0	0	0	0
O <sub>10</sub>	0	0	0	0	1	0	0	0	0	0	0	0
O <sub>11</sub>	0	0	0	0	0	0	0	0	0	1	0	0
O <sub>12</sub>	0	0	0	0	0	0	1	0	0	0	1	0



Process 2:

Let  $S_1 = (010000000000)$

$S_1 B \rightarrow (010000010000) = S_1^1$

$S_1^1 B = (010000010000) \times B$

$S_1^1 B \approx (010000000000) \times B$

$\rightarrow (000000010000)$

$$= (00000010000) \times B \longrightarrow (00000100011)$$

Consider  $S_2 = (00000100011)$

$$S_2 B \longrightarrow (010000101110) = S_2^1$$

$$S_2^1 B = (010000101110) \times B$$

$$S_2^1 B \approx (01000000000) \times B$$

$$\longrightarrow (000000101110)$$

$$= (00000010000) \times B \longrightarrow (00000001000)$$

$$= (00000000100) \times B \longrightarrow (00000001000)$$

$$= (00000000010) \times B \longrightarrow (00001000000)$$

$$= (00000000010) \times B \longrightarrow (00000000100)$$

Consider  $S_3 = (00000010000)$

$$S_3 B \longrightarrow (010000100011) = S_3^1$$

$$S_3^1 B = (010000100011) \times B$$

$$S_3^1 B \approx (01000000000) \times B$$

$$\longrightarrow (000000100011)$$

$$= (00000010000) \times B \longrightarrow (00000000100)$$

$$= (00000000010) \times B \longrightarrow (00000000010)$$

$$= (00000000001) \times B \longrightarrow (000000100010)$$

Consider  $S_4 = (000000100010)$

$$S_4 B \longrightarrow (010000001100) = S_4^1$$

$$S_4^1 B = (010000001100) \times B$$

$$S_4^1 B \approx (01000000000) \times B$$

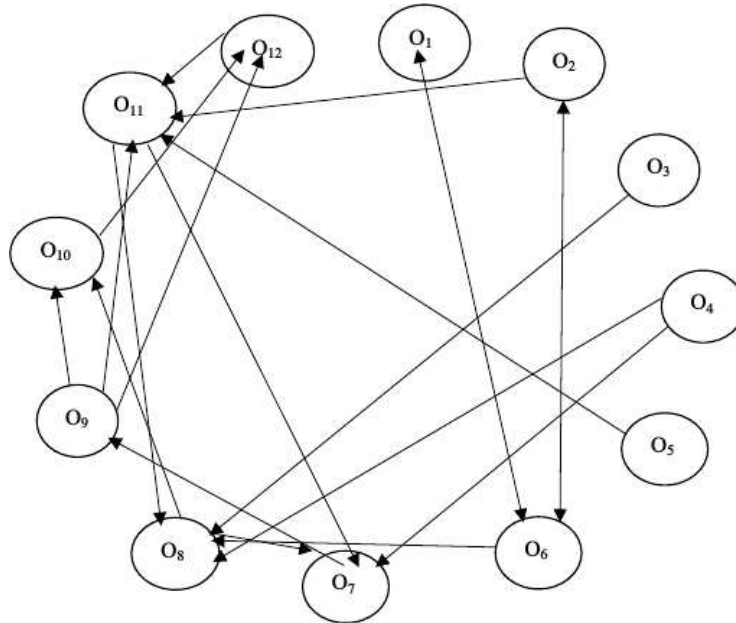
$$\longrightarrow (000000001100)$$

$$= (00000000100) \times B \longrightarrow (00000001000)$$

$$= (00000000010) \times B \longrightarrow (00001000000)$$

Analysis based on the opinion of Third expert:

	O <sub>1</sub>	O <sub>2</sub>	O <sub>3</sub>	O <sub>4</sub>	O <sub>5</sub>	O <sub>6</sub>	O <sub>7</sub>	O <sub>8</sub>	O <sub>9</sub>	O <sub>10</sub>	O <sub>11</sub>	O <sub>12</sub>
O <sub>1</sub>	0	0	0	0	0	1	0	0	0	0	0	0
O <sub>2</sub>	0	0	0	0	0	1	0	0	0	0	1	0
O <sub>3</sub>	0	0	0	0	0	0	0	1	0	0	0	0
O <sub>4</sub>	0	0	0	0	0	0	1	1	0	0	0	0
O <sub>5</sub>	0	0	0	0	0	0	0	0	0	0	0	1
O <sub>6</sub>	1	1	0	0	0	0	0	1	0	0	0	0
O <sub>7</sub>	0	0	0	0	0	0	0	0	1	0	0	0
O <sub>8</sub>	0	0	0	0	0	0	1	0	0	1	0	0
O <sub>9</sub>	0	0	0	0	0	0	0	0	0	1	1	1
O <sub>10</sub>	0	0	0	0	0	0	0	0	0	0	0	1
O <sub>11</sub>	0	0	0	0	0	0	1	1	0	0	0	0
O <sub>12</sub>	0	0	0	0	0	0	0	0	0	0	1	0



Process 3:

$$\text{Let } S_1 = (010000000000)$$

$$S_1 C \longrightarrow (010001000010) = S_1^1$$

$$S_1^1 C = (010001000010) \times C$$

$$S_1^1 C \approx (010000000000) \times C$$

$$\longrightarrow (000001000010)$$



$$= (000001000000) \times C \longrightarrow (110000010000)$$

$$= (000000000010) \times C \longrightarrow (000000110000)$$

Consider  $S_2 = (110000010000)$

$$S_2C \longrightarrow (010001100110) = S_2^1$$

$$S_2^1C = (010001100110) \times C$$

$$S_2^1C \propto (010000000000) \times C$$

$$\longrightarrow (000001100110)$$

$$= (000001000000) \times C \longrightarrow (110000010000)$$

$$= (000000100000) \times C \longrightarrow (000000001000)$$

$$= (000000000100) \times C \longrightarrow (000000000001)$$

$$= (000000000010) \times C \longrightarrow (000000110000)$$

Therefore  $S_3 = (110000010000) = S_2$

	O <sub>1</sub>	O <sub>2</sub>	O <sub>3</sub>	O <sub>4</sub>	O <sub>5</sub>	O <sub>6</sub>	O <sub>7</sub>	O <sub>8</sub>	O <sub>9</sub>	O <sub>10</sub>	O <sub>11</sub>	O <sub>12</sub>
01	0	0	0	0	0	1	0	0	0	0	0	1
02	0	0	0	0	0	1	0	1	0	0	1	1
03	0	0	0	1	0	1	0	1	0	0	1	0
04	0	1	0	0	0	0	1	1	0	0	1	0
05	0	0	0	0	0	1	0	0	0	0	1	1
06	1	1	0	1	0	0	0	1	0	0	1	1
07	0	0	0	0	0	0	0	1	1	0	0	0
08	0	0	0	0	0	0	1	0	0	1	1	1
09	0	0	0	0	0	0	1	0	0	1	1	1
010	0	0	0	0	1	0	0	0	0	0	1	1
011	0	0	0	1	0	1	1	1	0	1	0	0
012	0	0	0	0	0	0	1	1	0	0	1	0

Process 4:

$$\text{Let } S_1 = (100000000000)$$

$$S_1E \longrightarrow (100001000001) = S_1^1$$

$$S_1^1E = (100001000001) \times E$$

$$S_1^1E \propto (100000000000) \times E$$

$$\longrightarrow (000001000001)$$

$$= (000001000000) \times E \longrightarrow (110100010011)$$

$$= (000000000001) \times E \longrightarrow (000000110010)$$

Consider  $S_2 = (110100010011)$

$$S_2 E \longrightarrow (110101110111) = S_2^1$$

$$S_2^1 E = (110101110111) \times E$$

$$S_2^1 E \approx (100000000000) \times E$$

$$\longrightarrow (010101110111)$$

$$= (010000000000) \times E \longrightarrow (000001010011)$$

$$= (000100000000) \times E \longrightarrow (010000110010)$$

$$= (000001000000) \times E \longrightarrow (110100010011)$$

$$= (000000100000) \times E \longrightarrow (000000011000)$$

$$= (000000010000) \times E \longrightarrow (000000100111)$$

$$= (000000000100) \times E \longrightarrow (000010000011)$$

$$= (000000000010) \times E \longrightarrow (000101110100)$$

$$= (000000000001) \times E \longrightarrow (000000110010)$$

Therefore  $S_3 = (110100010011) = S_2$

## 4 Conclusion

Analyzing the problem,  $(110100010011)$  is obtained as the fixed point resulting i.e.

$S_1$  - Low income

$S_2$  - Stress

$S_4$  - Not able to answer the questions raised by the children on their family life.

$S_8$  - Children suffer emotional behaviour problems.

$S_{11}$  - Inferiority complex developed by the mother

$S_{12}$  - Undisciplined life led by deserted father.

Hence, these are the major problems suffered by the single parent and their reflection on children growth.

## References

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