

CONNECTIONS BETWEEN WILL TO EMIGRATE AND ATTACHMENT THEORY – A DATA MINING APPROACH¹

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Abstract:

Many studies have been carried out in the last years in Romania, due to the scale of the phenomenon, on the factors that are responsible for the migration decision of people and the consequences of this act.

The family is being generally accepted as the nucleus of a society and that's why is very important to create a medium where it can develop and grow in a healthy way. Family is one of the 12 domains of our main study direction, quality of life and it still is the first options when it comes to individual's support.

A new aspect that should be brought into attention should be represented by the recent findings in the emigration research domain, which show that there is a significant relationship between the will to emigrate and an unresolved attachment status.

So, we would like to see if indeed the emigration decision is based on financial motivations, as we've discovered so far, or it also has ties with other indicators.

Key words: family, attachment theory, emigration, data mining, teachers

1. Introduction

Many studies have been carried out in the last years in Romania, due to the scale of the phenomenon, on the factors that are responsible for the migration decision of people and the consequences of this act. We can encounter in the research literature, as major domains of research, different approaches, such as economical [1,18], sociological [28, 40], educational [41, 22] or psychological [46, 37] directions, each of them having their own sub directions that most of the times intersect each other, thus needing an interdisciplinary approach.

Although much has been written regarding the migration process of Romanians in general, very few studies approach the problem on a smaller scale, such as socio-professionals categories. We can talk about the brain-drain problem here, which like all

major concepts, has been discussed in the beginning without analyzing a certain category and only in the last couple of years it began to know a more focused approach, the attention of the research community being mainly drawn by the migration of specialists from health care and IT. As a consequence to that, in one of our past studies we have tried to approach the migration subject from a different category's point of view, namely teachers [21]. We've tried to discover, by employing data mining techniques, the motivations that reside behind the emigration decision of this category based on their marital status and found out that the economical factor is of great importance for the married without children and unmarried ones while for the ones that are married with children the family comes first.

The family is being generally accepted as the nucleus of a society and that's why is very important to create a medium where it can develop and grow in a healthy way. Also, family is one of the 12 domains of our main study direction, quality of life and it still is the first options when it comes to individual's support [15]. Regardless if we are talking about close or enlarged family, its members offer comfort to the individual whether we are considering its moral, financial or other needs. Another aspect that should be brought into the equation should be that recent findings in the emigration research domain show that there is a significant relationship between the will to emigrate and an unresolved attachment status [47]. Attachment theory refers to the way a human responds within relationships after he has been heart, separated from its loved ones or threatened, this way being formed in early life, before we can talk, based on how reliable, responsive and understanding our caregiver is [10]. Having these in mind, we are set to analyze the will to emigrate of our subjects by dividing them into groups depending on the vital status of their parents.

2. Problem Formulation

The necessary data for conducting the following study has been extracted from the general data base generated by our main research direction, quality of life of pre-university professors from Cluj-Napoca. This direction, being one that covers all domains of one's life, generates a very large quantity of data and includes aspects about close and enlarged family. The questionnaire, especially developed for this research, using EQLS's approach with 12 domains: health, job, income, education, family, social involvement, housing, environment, infrastructure, personal safety, leisure and life satisfaction, has been distributed to all physical education professors from pre-university schools from Cluj-Napoca, the most important city in the Nord-West development region, second largest in Romania and at the same time one of the largest university centers in the country. After centralizing the results, we've counted 105 valid answers from a total of 149 potential respondents, thus having a response rate of 70,46%.

After a first analysis we've identified several indicators as potential material for future studies, because of their unusual high values. Among these indicators the will to emigrate was by far the one that registered the highest values, 38% of the respondents that offered valid answers saying they would like to emigrate and if this wasn't concerning enough, 22% of these stated that they would emigrate anywhere. As a consequence to this we've started to analyze this particular indicator in relation with others that we've considered they could influence it. First on our list was to see how this indicator varies depending on the marital status of our respondents, so in relation with their close family, because a lot of issues could come from this decision, including relational problems with their life partner, or

even worse psychological traumatizing experiences or sentimental deprivation for children [21]. We then continued with its analysis in relation with the financial status of our respondents, starting from the premises that the decision to emigrate has strong ties with the way they cope with daily financial needs [24]. In the present paper, after revising the research literature, we would like to return to the family indicator but from another perspective, enlarged family, more precisely how the emigration indicator varies among our subjects in relation with the vital status of their parents, mostly because all of our subjects declared that have a good and very good relation with their families, family support being an important part of the quality of life assessment and also because it seems that there are strong ties between the will to emigrate and attachment problems, that occur in early life mainly because the caregiver, usually the parents, don't respond well to the needs of the child. So we would like to see if indeed the emigration decision is based on financial motivations, as we've discovered so far, or it also has ties with other indicators.

As a result, we were set to analyze which could be the indicators that had the most influence in the decision to emigrate, how these decisions differentiate based on the vital status of our respondent's parents and if there's a connection with the attachment theory. In order to achieve this, we've split the study group into four categories by taking into consideration their answers to their parent's vital status:

1. Their mother and father are alive – coded as "mom_yes_dad_yes" for compatibility with the utilized software;
2. Their mother is alive and their father is dead – coded as "mom_yes_dad_no" for compatibility with the utilized software;
3. Their mother is dead and their father is alive – coded as "mom_no_dad_yes" for compatibility with the utilized software;
4. Their mother and father are dead – coded as "mom_no_dad_no" for compatibility with the utilized software.

The fifth category, "NA", comprised of the ones that haven't answered to the income question, was excluded because it didn't bear any relevance.

3. State of the Art Research

3.1. Emigration and family

Confucius said "The strength of a nation derives from the integrity of the family". So, in accordance with this statement if we were to change something in our country we should begin by promoting and supporting the concept of a united family.

Kent Hoffman, which is one of the founders of a parental training program based on the theory of attachment, stated at one of his seminars held in Romania that the dynamic of family from ex communist countries was very affected and distorted by this doctrine, but at the same time those hard times managed to unite it and strengthen the connections between its members.

If communism is a thing of the past, at least on paper, our society is confronted nowadays with new challenges. One of the toughest it seems to be the impossibility to offer young capable people a stable and healthy environment where they can develop, start a family and live a decent life. Recent studies have surfaced worrying results such as the fact that the majority of the ones that chose to emigrate belong to the age interval 20-35, which represents basically the ideal fertile period and more so, over 60% of these are females [42].

These findings can explain the low fertility rates that Romania faces in present. Also, another problem could be represented by the fact that a large number of highly qualified workers, doctors, nurses, engineers, informaticians, choose to emigrate [35, 39].

Having in mind these drawing attention findings, some researchers tried to identify the reasons behind peoples will to emigrate and found that most of them are seeking a better salary and a higher standard of living [4]. Although several studies have shown that there are some benefits, mostly economical, for the families that have one or both adults members implicated in an emigration process [3], the vast majority of the research literature states the same conclusion: long term effects on family are devastating and it usually begins with the alienation of its members and ends with scission, the most affected being the children which can develop unhealthy psychological behaviors [13, 38, 6]. If adults can, at some point, get over the pain caused by a separation, children on the other hand will remain with scars that will be transmitted to further generations, this being the reason why it is so important to take care of our children within the family unit.

The ideal situation, towards which we should aspire, would be to raise our children in a happy stable family, because it has been scientifically proven that happy raised children manage to do better in life on all areas when they benefit of the care of both parents [27], without thinking about the money. Happiness is free and paradoxically at the same time expensive. It can be achieved for free by doing small things that cost you nothing, like a kind word, offering a helping hand, moral support or by simply being there, or you can work hard to earn it, although with a different outcome, as researchers from the Warwick University have discovered [50].

3.2. Data mining

Data mining is defined as the “nontrivial process of extracting valid, previously unknown, comprehensible and useful information from large databases” [36]. Fayyad et al., [16] identified that for the knowledge to be discovered through this technique some preparatory steps need to be fulfilled: data cleaning, data reduction, data transformation, data mining and pattern evaluation.

Classical data mining techniques were mostly used to collect data and later became a tool for analyzing large quantity of data [2]. In the last years, its role has extended beyond initial borders, today being encountered in almost all fields, such as marketing, banking, medicine, astronomy, education, sociology, etc., thus becoming an important tool in decision making processes. Its utilization basically flourished due to the fact that almost every life domain became data-intensive [48].

In the research literature we have found many studies that use data mining techniques covering various fields: security technology [33], manufacturing [26], banking [14], management [45], sport [34], medicine [29], transport [49], etc., but very few that used data mining techniques upon traditional education. Instead, we could observe that this method is nowadays extensively used in e-learning [25, 43, 11, 52, 31, 32]. We have managed in some of our past studies to associate it with traditional education by successfully establishing raw connections between various indicators concerning life of pre-university schools teachers. This offered us unique inside perspectives with a direct impact on the national educational system [21, 23, 24].

The data mining method most used in our research was classification learning and allowed us to automatically learn models [51]. We have based our approach towards

classification on decision trees, mainly due to the fact that they can operate under supervision by being provided with the actual outcome for each of the training examples. The models have been used for scanning the data in order to generate trees and make predictions.

The instances are classified by decision trees based on their feature values, each node being a feature in an instance to be classified and each branch a value the node can obtain [30]. The main advantages of this method are that it creates models that are easy to understand and missing values within the data don't affect them [5], although due to the fact that it only permits single dependent variable it can create certain restrictions [44].

For the present classification learning experiment, J48 and J48graft methods (developed from C4.5 algorithm) have been employed, with the help of the very popular Weka 3 open source GNU software for machine learning [51].

3.3. Attachment theory

John Bowlby, who is considered to be the father of attachment theory, defined it as "one specific and circumscribed aspect of the relationship between a child and caregiver that is involved with making the child safe, secure and protected" [7].

The emergence of this theory dates back to the late '40's, when Bowlby began with the help of James Robertson to observe hospitalized and institutionalized children that have been separated from their parents[12]. After some studies he concluded, based on empirical evidence, that a small child in order to grow up mentally healthy "should experience a warm, intimate, and continuous relationship with his mother, or permanent mother substitute, in which both find satisfaction and enjoyment" [9]. Also, he emphasized on the role of social networks and economy as factors which influence well developed functioning relationships between mother and child stating in one of his books that "children are absolutely dependent on their parents for sustenance, so in all hut the most primitive communities, are parents, especially their mothers, dependent on a greater society for economic provision. If a community values its children it must cherish their parents" [17].

Unfortunately the negative outcome of this behavior has long term repercussions on the individual because "the initial relationship between self and others serves as blueprints for all future relationships" [8].

So, returning to the context of our study, the vast majority of our respondents lived most of their life or have been raised for the first years of their life in a communist society. Family in the communism period although was proclaimed in the official ideology as "basic cell of the society", wasn't just a simple propaganda but a justification of the intervention of the state in private space, in order to gain control by destroying its traditional values [19]. The extensive character of the communist economy, in the context of a forced industrialization, required growth of human workforce. So, along with the exploitation of the rural workforce, came the concept of women emancipation, which in order to function required for women to be relieved of family duties [19].

If we analyze these statements with the ones in the previous paragraph we start to see that some connections begin to form. A lot of our subjects want to emigrate and not all of them have financial reasons behind, as we've discovered in our previous studies. Children with attachment problems have a tendency to run away from home [20] and as long as this wish of alienation persists even after reaching adult age and no other reasons such as financial exist, we can consider emigration a form of "run away". In this regard, a recent

study has analyzed from the attachment's theory perspective the Dutch and Belgian immigrants from California and found a significant relationship between unresolved attachment status and being an immigrant [47].

4. Results

4.1. Mother alive, father alive

We proceed by analyzing the first category, where both parents of our respondents are alive. This is the most numerous group with a number of 51 subjects, from which 29 wish to emigrate, the average age being 33.29. After employing data mining techniques we've obtain the following decision tree, which is graphical represented in figure number 1.

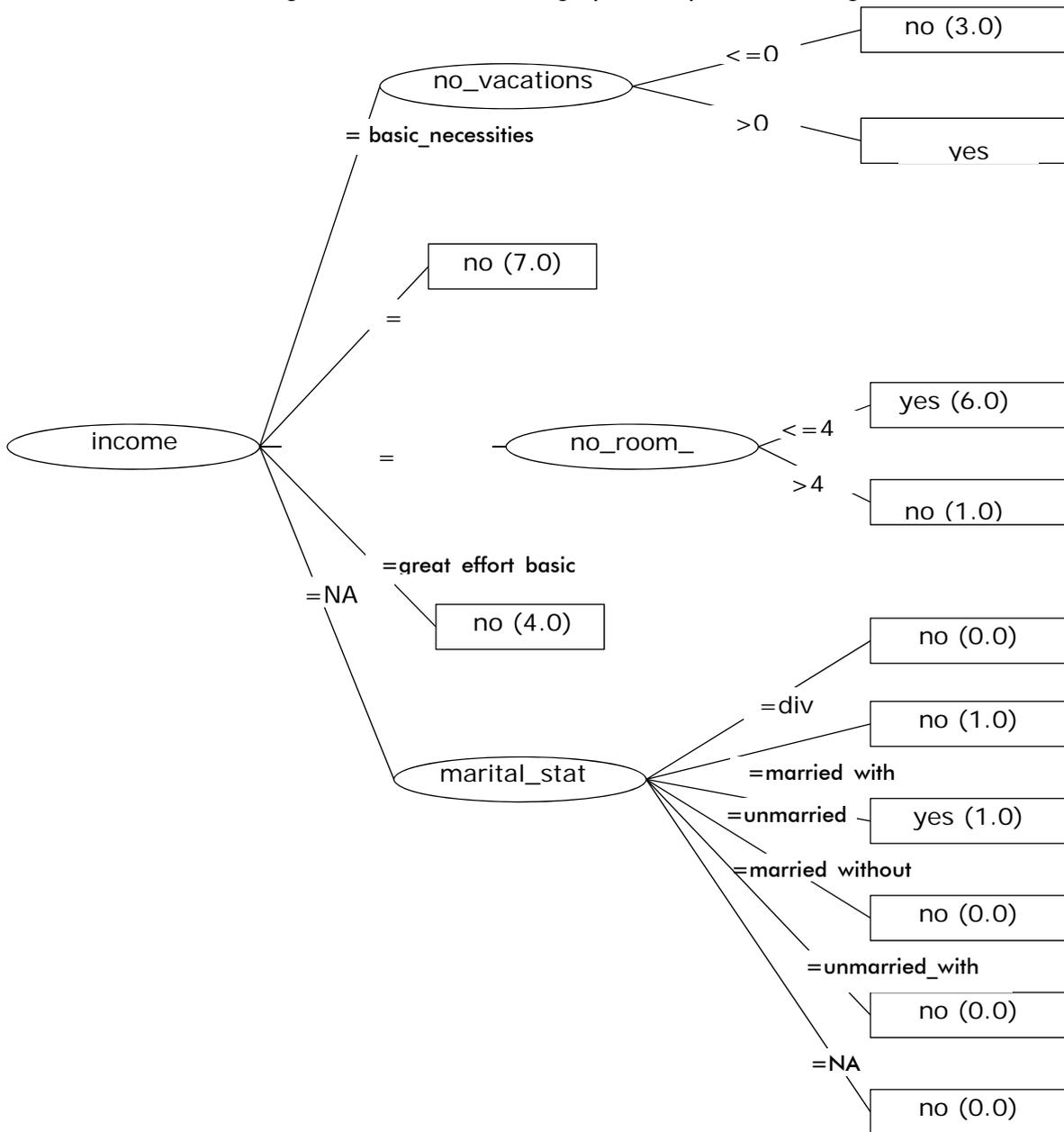


Figure 1. J48 decision tree based on "mom_yes_dad_yes" group

As we can see, the main indicators that influence the will to emigrate for this group are of financial type. So, the respondents that are most likely to emigrate are of 3 types: a) the ones that have an income that only covers their basic necessities and managed to spend more than 0 vacations in the last five years in a resort from Romania or abroad with 19 persons. These were initially divided, by their answers to the will to emigrate, in 7 that didn't want and 12 that did. So, our program, as we can see from the bellow graph, identified 4 persons from the ones that initially stated they don't wish to emigrate as in fact being potential candidates for emigration; b) the ones that consider that their income doesn't cover even their basic necessities and have an apartment with less than 4 rooms with 7 persons. In this group's case our program kept the initial distribution of the respondents based on their questionnaire answers with 6 that would wish to emigrate and 1 not; c) the ones that didn't respond to the income indicator and are unmarried with 1 person for which our program hasn't found any other connections.

Concerning direct connections with attachment issues, our program didn't identified any, because indicators that could suggest such a thing like "help from parents" or "members of living unit", weren't taken into consideration. So, in order to find some connections we've dug deeper and isolated for each of the 3 groups the ones that have been identified by the program as potential candidates for emigration and found out that: for the a) group 4 persons from total 16 ones have a special cohabitation situation, in the sense that they are still living with their parents and more than that, all of them are unmarried and have ages very close and over 30, so it's possible that these particular subjects could experiment attachment problems. The help that they are receiving from parents consists only in food; for the b) and c) groups we could not find any connections.

4.2. Mother alive, father dead

We've continued by analyzing the second category, in which case only the mother of our respondents is alive. This group has a number of 25 subjects with an average age of 45,96. As we've discovered in our previous studies, once the age increases the will to emigrate decreases and this is also true for this group, because only 5 persons want to emigrate. Another possible explanation for the low number of persons that wish to emigrate would be that only their mother is alive and they choose to stay around and help. After running the program on the data, we've identified that for this group the indicators that count the most, when talking about emigration, are the ones related to work and family. So, the most likely to emigrate belong to 4 categories: a) the ones that have a second job and evaluate the educational system as being one of a poor quality with 2 respondents; b) the ones that have a second job and didn't respond to the question regarding the quality of the educational system with one person; c) the ones that don't have a second job and live with their life partner and parents with one person; d) the ones that don't have a second job and live with their child with one person.

As we can see from the graphic bellow, our program discovered some direct connections between one of the indicators that could signalize attachment problems "members of living unit" and will to emigrate. After the isolation of these two persons, we've observed something very interesting: the one that doesn't have a second job and lives with his life partner and parents answered negative to the will to emigrate question, but the program, as we can see, indentified him as a potential emigrant; and the one that declared he lives only with his children, his marital status is married, although he had the divorced or

widow options to choose from, so we would be inclined to think that these two persons have some problems of attachment.

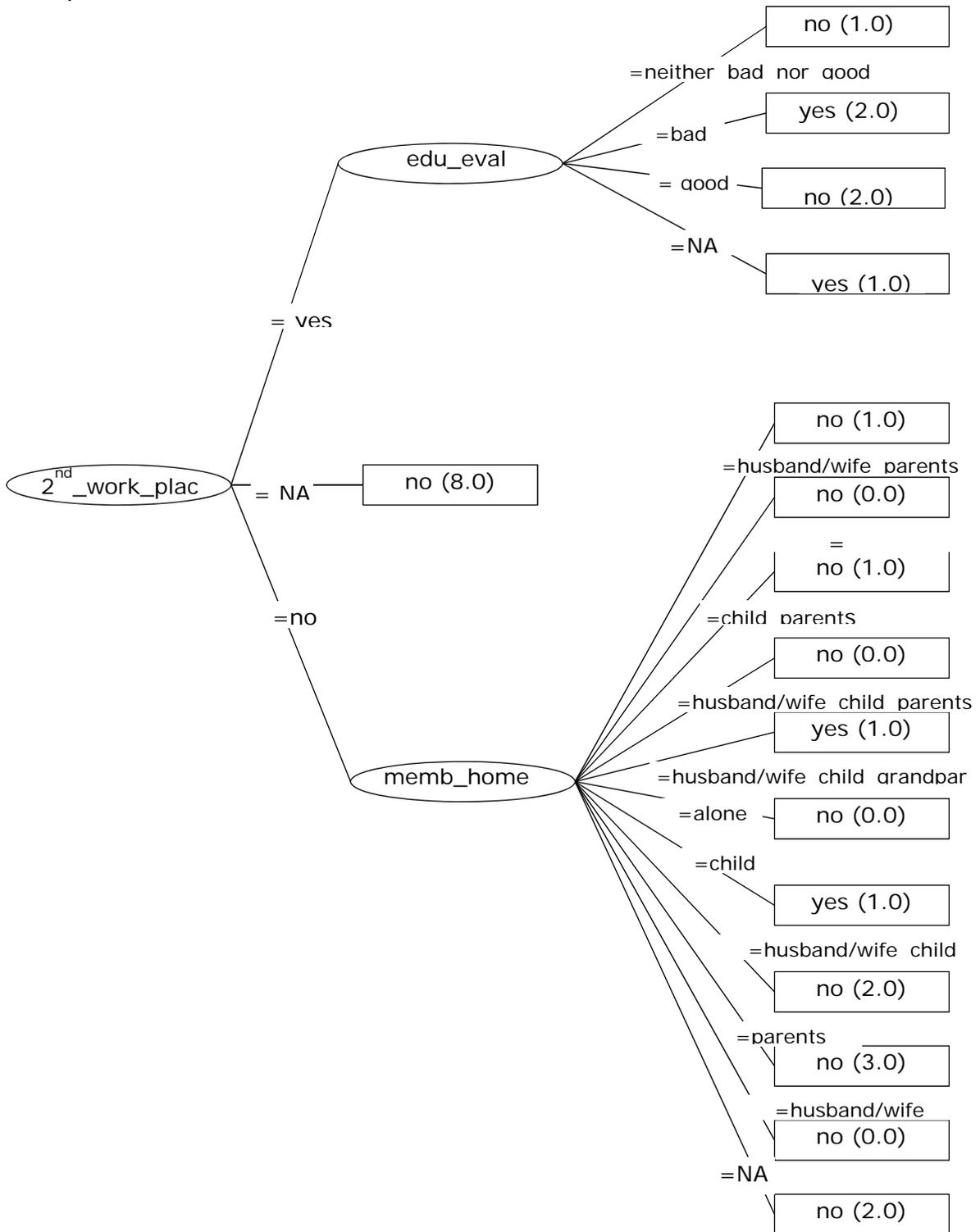


Figure 2. J48 decision tree based on "mom_yes_dad_no" group

In order to find connections between attachment theory and will to emigrate for the other 3 persons belonging to the a) and b) groups, we've proceeded as in the case of the

precedent category and isolated them. The findings were interesting, because one of two persons that were identified by the program to belong to the a) group presents similar characteristics as the ones from the a) group in "mother alive, father alive" category. He's unmarried with the age of 31 and lives with his parents, in this case only with his mother. The help received from parent consists in durable goods.

4.3. Mother dead, father alive

The third category is represented by the ones that declared their mother is dead and their father is alive and it is the smallest of our study with only 3 respondents. Average age continues to increase reaching 50,3. Our program has identified for this category as principal indicator in the decision to emigrate gender, factors that could be related to attachment problems not being directly taken into consideration. Although it doesn't bare much relevance, because of the small number of respondents, we would like to proceed with a small analysis. So, as we can see from the bellow graph, if they are females they do not want to emigrate and if they are males they do. After isolating the one that wants to emigrate we also couldn't find any relations to the indicators that could signal an attachment problem.

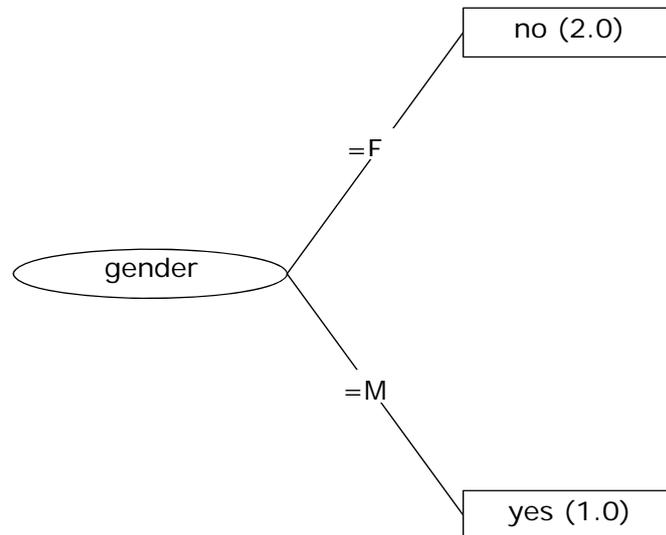


Figure 3. J48 decision tree based on "mom_no_dad_yes" group

4.4. Mother dead, father dead

Last group of our study is represented by the ones that declared that none of their parents are alive. It has 22 respondents and an average age of 57,72. For this group the indicators that count the most in the emigration decision, as we can see from the bellow graph, are ones of financial type. Initially 4 respondents from this group stated they would like to emigrate, but our program has identified, based on their answers to the others indicator, that one of them actually wouldn't. The most likely to emigrate belong to 2 categories: a) the ones that own an apartment and land with 2 persons; and b) the ones that own an apartment and a car and their income doesn't even cover their basic necessities with one person. Due to the fact that both parents of the subjects included in this category are dead it will be irrelevant to pursue a connection between will to emigrate and attachment theory.

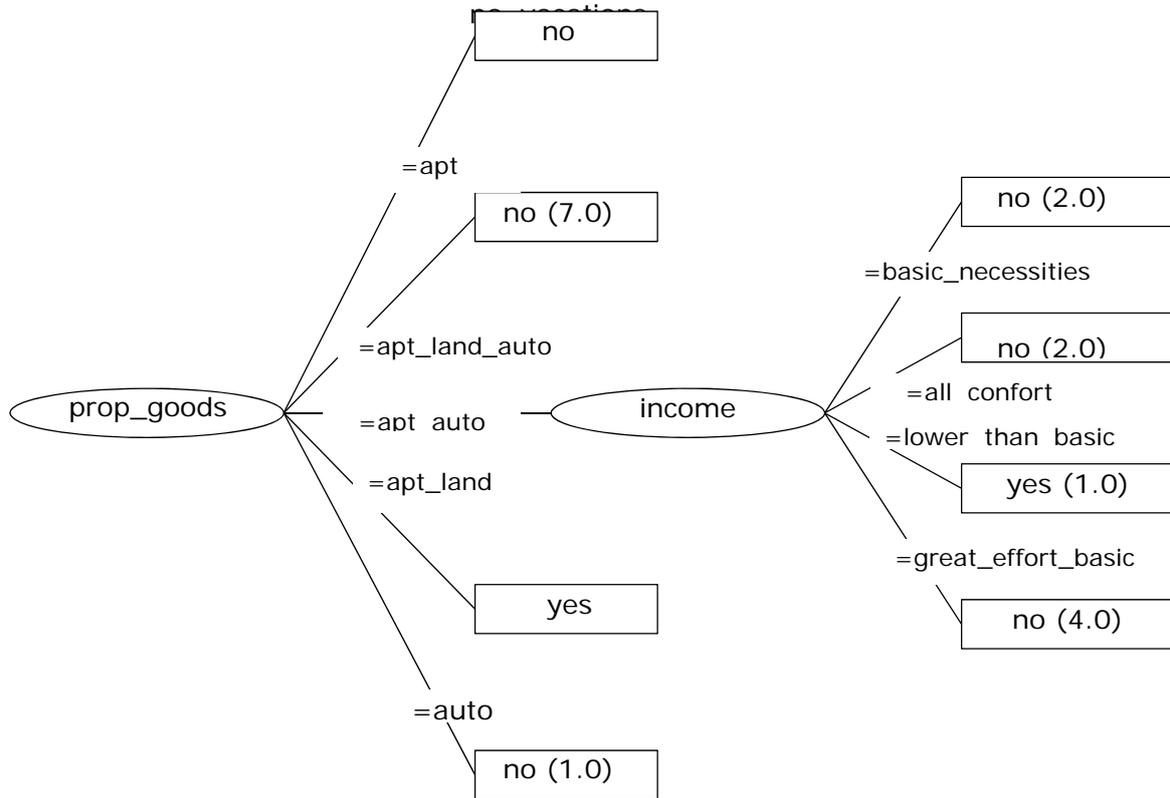


Figure 4. J48 decision tree based on "mom_no_dad_no" group

5. Conclusions

Although the relevance of this study can be easily contested, mainly due to the low number of respondents and the presence of not so many indicators related to the attachment theory, our goal wasn't necessarily to obtain hard evidence but to establish a conceptual framework and method for future studies.

Having this in mind we declare ourselves satisfied with the results and can affirm that data mining methods helped us on one hand to directly identify indicators that count for our respondents in the decision to emigrate based on the vital status of their parents and on the other hand to narrow down possible special cases for further analysis of the indicators that could denote problems in relation with attachment theory. In fact, we consider this method very promising because it managed to find in such a small number of respondents some cases that can be correlated to our main hypothesis.

The four categories chosen are in accordance with the findings of the studies conducted by the National Institute of Statistics which state that females benefit of a higher life expectancy than males and it is demonstrated, in our study, by the number of respondents for the first three categories. So, the very low number of respondents for the "mother alive, father dead" category would be somehow justified.

We continue by synthesizing the results given by the use of the data mining method. For the first category "mother alive, father alive" the main reasons for emigrating would be of financial type. For the second category "mother alive, father dead", the reasons change and refer to work and family. For the third "mother alive, father dead" category

although the number of respondents was very low the indicator that counted in the decision to emigrate or not was gender. For the last category "mother dead, father dead", as if it was a circle of life, the reasons return to financial ones.

We conclude with the findings related to the attachment theory. As a general rule, where our program didn't find any direct connections, we've proceeded with an individual analysis of the ones that were identified by the program with a wish to emigrate. For the first category "mother alive, father alive" no direct connections were found, so we've isolated the respondents and identified four possible drawing attention cases, mainly because of their cohabitation status, age and marital status. For the second category "mother alive, father dead" our program found direct connections through the indicator "members of living unit". Interestingly enough is the fact that this particular respondent, found by the program, has a very similar situation with the ones identified by us in our analysis of the first group, he's 31 years old, lives with his mother and is unmarried. For the third category "mother alive, father dead" neither the program nor us could find any connections, we think mainly due to the low number of respondents. The last category "mother dead, father dead" didn't bear any relevance in this case.

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Appendices

Appendix 1 - Mother alive, father alive

=== Run information ===

Scheme: weka.classifiers.trees.J48 -C 0.25 -M 1 -A

Relation: **mother alive, father alive**

Instances: 51

Attributes: 18

- marital_stat
- age
- sex
- no_child
- support_parent
- no_room_aprt
- prop_goods
- memb_home
- marriage
- achivement
- income
- will_emigr
- no_vacations
- 2nd_work_place
- soc_traject
- edu_eval
- fin_retrib

```
prof_eval
Test mode: evaluate on training data

=== Classifier model (full training set) ===
```

```
J48 pruned tree
-----
income = basic_necessities
| no_vacations <= 0: no (3.0)
| no_vacations > 0: yes (16.0/4.0)
income = great_effort_basic: yes (16.0/6.0)
income = all_confort: no (7.0)
income = lower_than_basic
| no_room_aprt <= 4: yes (6.0)
| no_room_aprt > 4: no (1.0)
income = NA
| marital_stat = div: no (0.0)
| marital_stat = married_with: no (1.0)
| marital_stat = unmarried: yes (1.0)
| marital_stat = married_without: no (0.0)
| marital_stat = NA: no (0.0)
| marital_stat = unmarried_with: no (0.0)
```

```
Number of Leaves :      12
Size of the tree :      16
Time taken to build model: 0.01 seconds
```

```
=== Evaluation on training set ===
=== Summary ===
```

```
Correctly Classified Instances      41      80.3922 %
Incorrectly Classified Instances     10      19.6078 %
Kappa statistic                     0.5771
Mean absolute error                  0.3315
Root mean squared error              0.3809
Relative absolute error              67.5203 %
Root relative squared error          76.9048 %
Total Number of Instances           51
```

```
=== Detailed Accuracy By Class ===
```

	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC	Area	Class
	0.545	0	1	0.545	0.706		0.846	no
	1	0.455	0.744	1	0.853		0.846	yes
Weighted Avg.	0.804	0.258	0.854	0.804	0.79	0.846		

```
=== Confusion Matrix ===
```

```
a b <-- classified as
12 10 | a = no
0 29 | b = yes
```

Appendix 2 - Mother alive, father dead

```
=== Run information ===
```

```
Scheme: weka.classifiers.trees.J48 -U -M 2
Relation: mother alive father dead
Instances: 25
Attributes: 18
```

```
marital_stat
age
sex
no_child
support_parent
no_room_aprt
prop_goods
memb_home
marriage
achivment
```

```

income
will_emigr
no_vacations
2nd_work_place
soc_traject
edu_eval
fin_retrib
prof_eval
Test mode: evaluate on training data
=== Classifier model (full training set) ===

```

```

J48 unpruned tree
-----
2nd_work_place = yes
| edu_eval = good: no (2.0)
| edu_eval = neither_bad_nor_good: no (1.0)
| edu_eval = bad: yes (2.0)
| edu_eval = NA: yes (1.0)
2nd_work_place = no
| memb_home = husband/wife: no (0.0)
| memb_home = NA: no (2.0)
| memb_home = parents: no (3.0)
| memb_home = husband/wife_child: no (2.0)
| memb_home = husband/wife_parents: no (1.0)
| memb_home = child: yes (1.0)
| memb_home = alone: no (0.0)
| memb_home = husband/wife_child_grandparents: yes (1.0)
| memb_home = husband/wife_child_parents: no (0.0)
| memb_home = child_parents: no (1.0)
memb_home = husband/wife_nephew: no (0.0)
2nd_work_place = NA: no (8.0)

```

```

Number of Leaves: 16
Size of the tree: 19
Time taken to build model: 0 seconds

```

```

=== Evaluation on training set ===
=== Summary ===

```

Correctly Classified Instances	25	100	%
Incorrectly Classified Instances	0	0	%
Kappa statistic	1		
Mean absolute error	0		
Root mean squared error	0		
Relative absolute error	0	%	
Root relative squared error	0	%	
Total Number of Instances	25		

```

=== Detailed Accuracy By Class ===

```

	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
	1	0	1	1	1	1	no
	1	0	1	1	1	1	yes
Weighted Avg.	1	0	1	1	1	1	

```

=== Confusion Matrix ===

```

```

a b <-- classified as
20 0 | a = no
0 5 | b = yes

```

Appendix 3 - Mother dead, father alive

```

=== Run information ===

```

```

Scheme: weka.classifiers.trees.J48 -U -M 1
Relation: mother dead father alive
Instances: 3
Attributes: 18

```

```

    marital_stat
    age
    sex
    no_child
    support_parent
    no_room_aprt
    prop_goods
    memb_home
    marriage
    achivement
    income
    will_emigr
    no_vacations
    2nd_work_place
    soc_traject
    edu_eval
    fin_retrib
    prof_eval
Test mode:evaluate on training data

=== Classifier model (full training set) ===

J48 unpruned tree
-----
sex = F: no (2.0)
sex = M: yes (1.0)

Number of Leaves :      2
Size of the tree :    3
Time taken to build model: 0 seconds

=== Evaluation on training set ===
=== Summary ===

Correctly Classified Instances      3      100 %
Incorrectly Classified Instances    0       0 %
Kappa statistic                     1
Mean absolute error                  0
Root mean squared error              0
Relative absolute error              0 %
Root relative squared error          0 %
Total Number of Instances          3

=== Detailed Accuracy By Class ===

          TP Rate  FP Rate  Precision  Recall  F-Measure  ROC Area  Class
          1         0         1           1         1           1         no
          1         0         1           1         1           1         yes
Weighted Avg.   1         0         1           1         1           1

=== Confusion Matrix ===

a b <-- classified as
2 0 | a = no
0 1 | b = yes

```

Appendix 4 - Mother dead, father dead

```

=== Run information ===

Scheme: weka.classifiers.trees.J48 -U -M 2
Relation:  mother dead father dead
Instances:  22
Attributes:  18

    marital_stat
    age
    sex
    no_child
    support_parent
    no_room_aprt

```

```
prop_goods
memb_home
marriage
achivement
  income
will_emigr
no_vacations
2nd_work_place
soc_traject
edu_eval
fin_retrib
prof_eval
```

Test mode: evaluate on training data

=== Classifier model (full training set) ===

J48 unpruned tree

```
-----
prop_goods = apt: no (3.0/1.0)
prop_goods = apt_auto
| income = basic_necessities: no (2.0)
| income = great_effort_basic: no (4.0)
| income = all_confort: no (2.0)
| income = lower_than_basic: yes (1.0)
prop_goods = apt_land_auto: no (7.0)
prop_goods = apt_land: yes (2.0)
prop_goods = auto: no (1.0)
```

Number of Leaves : 8
Size of the tree : 10
Time taken to build model: 0 seconds

=== Evaluation on training set ===
=== Summary ===

Correctly Classified Instances	21	95.4545 %
Incorrectly Classified Instances	1	4.5455 %
Kappa statistic	0.8308	
Mean absolute error	0.0606	
Root mean squared error	0.1741	
Relative absolute error	19.2771 %	
Root relative squared error	45.0273 %	
Total Number of Instances	22	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	ROC	Area	Class
	0.75	0	1	0.75	0.857	0.986	0.986	yes
	1	0.25	0.947	1	0.973	0.986	0.986	no
Weighted Avg.	0.955	0.205	0.957	0.955	0.952	0.986		

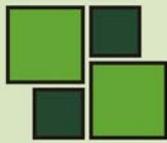
=== Confusion Matrix ===

```
a b <-- classified as
3 1 | a = yes
0 18 | b = no
```

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