

Unhappy at home: should you blame your partner's job? An Empirical Study of happiness transmission

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Preliminary results – do not quote

February 2005

Abstract: Do happy or unhappy individuals contaminate the other members of their household? The idea of within-household contagion effects has very seldom been explored in the literature, probably because the available household data are in general not informative enough with respect to the interdependence between the members of households. This paper incorporates some theoretical ideas from epidemiological models to the study of within-household spill-over effects. Two main goals are actually targeted. First, I examine the extent to which the overall household level of job satisfaction influences the level of life satisfaction of each of the parents; overall household job satisfaction being measured as the sum of individual levels, other than that of the individual of interest. Second, I explore how the probability of divorce is sensitive to the partners' levels of life satisfaction.

I use the French version of the European Community Households Panel (ECHP) for the period 1994-2001. I find significant contagion effects of the measure of subjective well-being (and bad-being) prevalence in the rest of the family members on the individual probabilities becoming happy (and unhappy respectively).

1. Introduction

Very few and recent studies have stressed the lack of interest in determining the interdependency in well-being at a household level (see Winkelmann, 2004). One reason for this is that individual behaviour among the family rarely is observable in surveys, other than the usual information like the family size, household income, type of housing and many modern conveniences information. For instance, some believe that partners' sexual behaviour might be an interesting pattern in life satisfaction

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studies. Despite the result found by Blanchflower and Oswald (2004) who pointed out using American data that sexual activity enters strongly in happiness equation, still it remains that the lack of information on the within-household behaviour drives economists to focus mainly on individuals' happiness. In this study I propose to gather two recent contributions (van Praag et al., 2002) and (Winkelmann, 2004) so I can use these empirical links to establish the model of well-being interaction within the household. Van Praag et al. (2002), using the German Socio Economic Panel (GSOEP), tried to connect several individual's life satisfaction domains and the General Satisfaction (GS) – namely happiness or subjective well being (see Frey and Stutzer, 2001) – and used a simultaneous equation, so they could explain “general satisfaction by the values of the satisfactions with respect to six distinct domains of life”. With the 8 waves of the French Household Panel Data, I propose to use the reported question on job satisfaction – where individuals may answer on 1 to 6 rated scale – to find out whether there exists a relationship between this reported answer to job satisfaction and a life satisfaction indicator which is built from 6 domains of life satisfaction. The lowest value 1 corresponds to “non satisfaction at all” reported feeling while the highest, 6, corresponds to a “very satisfied” position. Winkelmann (2004), using nine waves (1984-1992) of the GSOEP as well, seeks to quantify, through a multiple random effects ordered probit, the “intrafamily correlation in well-being”. He found that in the long run process, individuals well-being is strongly correlated within the same family. Indeed, an estimate of the correlation coefficient is 0.44. this estimate is even higher among siblings, 0.47.

My approach here is consisting not in measuring correlations but in providing evidence on a particular relationship that is how own job satisfaction of a family members affects the well-being of the one of them, and more precisely either the father or the mother.

2. Models of Job satisfaction transmission

The way the model is built reminds the one provided by Barmby and Larguem (2003) in a sickness contagion effects on workers absenteeism. But while sickness can only be transmitted by unhealthy to healthy people, the paper, here, focuses on two effects, namely, the effects of job satisfaction and job dissatisfaction on the subjective well-being.

Thus, not only is provided an estimate of the effect of happy workers on the probability of a family member becomes happy with her/his life (given that in past period they were unhappy) but also it is provided an estimate of the opposite effect, that is to say effects of unhappy workers on individual's life satisfaction.

The way the life satisfaction indicator is set is made possible through the domains of life satisfaction. These are: satisfaction with job or main activity, satisfaction with financial situation, satisfaction with housing, satisfaction with health, satisfaction with leisure time, satisfaction with social contacts, satisfaction with education or training.

The central empirical issue the paper faces is to specify the above probability in such a way that we can interpret the estimated parameters in terms of a coherent model of happiness contagion or transmission. To this end consider the event that a changing in life satisfaction for an individual i starts at time t , this is the event $(S_{i,t}^{Life} = 1 | S_{i,t-1}^{Life} = 0)$. The $S_{i,t}^{Life}$ gathers all the domains of life satisfaction and is equal to one if the domains reported value is greater or equal to 30. At time t the

individual who belongs to family F is exposed to $\sum_{\substack{j=1 \\ j \neq i}}^N JS_{F,j,t-1}$, namely the number of

the F family members who are potentially happy with their job (JS is the reported Job Satisfaction dummy). Given that the distribution of the subjective answers often are right skewed, the Dummy variable JS is equal to unit if individuals declare a reported satisfaction level with their job at least equal to five. Replicating the Barmby et al. (2003) approach, this study is willing to estimate the ease with which the happiness can be passed from a happy to an unhappy member is called transmission rate and denoted μ (See Philipson, 2000).

heterogeneity seriously. We assume the unobserved term in (3) is a drawing from $N(0,1)$ density $\phi(u)$ describing the distribution of the unobserved term in the population from which the sample is drawn, given this assumption we can integrate out to form a marginal likelihood (see Hsiao, 2003).

$$\text{Ln}L(\theta, \sigma) = \sum_{i=1}^N \text{Ln} \int_{-\infty}^{\infty} \prod_{t=2}^{T_i} F(\theta Z_{it} + u)^{S_{Fit}} (1 - F(\theta Z_{it} + u))^{(1-S_{Fit})} \phi(u) du \quad (4)$$

the CDF F is assumed Logistic.

3) Once the probability of becoming happy is predicted, it is used as an explanatory variable to explain whether the divorce decision can be sensitive to it. The causality effect of the sensitivity of life satisfaction to the within-household job satisfaction implies to lag forward the divorce decision. considering that divorcing decision is somewhat a long run process. At least the shortest term to be considered is to be greater or equal to one year.

To this end consider the event that a changing in marital status for an individual i starts at time $t+1$, this is the event $(D_{i,t+1} = 1 | D_{i,t} = 0)$. Then this change, from married to non married, is a function of covariates and the predicted probability given in equation (4)

$$D_{F,i,t+1}^* = D(\text{Pr}(S_{F,i,t}^*), \delta' Z_{i,t})$$

$$i = 1, \dots, N \quad t = 1, \dots, T_i \quad F = 1, \dots, F_i$$

3. Data

Our data is a sample of 39 248 individuals drawn from the 8 waves of the French version of the ECHP and who belong to 4596 households (with more than one individual). In this sample, we're dealing with workers and unemployed since to this category the main activity is unemployment and therefore can answer to both questions of job and life satisfaction. 18% of the sample *indirectly* report that they're happy with their life. The average age of the sample composed by 56% of males reaches 38.6 years. On average, workers declare to spend 37.5 hours per week in their work place. 89.2 % have permanent contracts and 66 % of them work in private.

Here I focus on individuals who belong to households with more than 1 person. In this case, 76% declare to live with a partner. In this sample 61 % are married, 30 % are single, 7 % are divorced and finally less than 2% are widowed. But it must be stressed that for accuracy issues, the selected sample takes account for people who are not married. Indeed, a simple descriptive cross-tabulation of marital status and partnership shows that it is important to consider individual that declare to be living in partnership and not be married.

More than 16% declare to be single when they share their life with another person. In the divorced sub-sample, the figures are 3.25%. In the same vein, 16% declare to be single while they share their life. In overall, are considered in this study about 30 000 individuals.

4. Results

The results are supportive of the notion that the family members' job satisfaction has an influence the other member's life satisfaction. Clark and Etilé (2003) found a correlation in partner's behaviour when looking at their smoking participation. In table 1 the socio-demographic parameters shows the commonly admitted negative u shape (see Clark, 1996) for age whose minimum level in terms of Life satisfaction is about 41 years old. The single, widowed and divorced individuals are less happy with their life than the married ones. The profile of workers with low

education level, with a part time contract, who live in big cities (more than 100 000 people), with manual jobs or do not have the French citizenship shows a lower subjective well-being than their respective counterparts. Moreover, the increasing numbers of visits to doctor plays a negative role in the probability of reaching happiness.

An interesting result to outline is that households with no children report a significantly higher happiness than the reference group that is a household with 2 children.

Finally, I find a strong significant (1% level) impact of household's job satisfaction (other than the individual i) on of the other members happiness. The probability of our individual i to become happy is increased by 0.66 point if the family job satisfaction is doubling. The interaction with the family size in order to pick up the possible weakening of the effect of Job Satisfaction shows a rather puzzling impact. Hence, in the estimates reported here, the job contagion effect on the within-family job life satisfaction seems to decrease the individual probability of becoming happier. Moreover, as shown in Levy-Garboua and Montmarquette (2003), the impact of the lagged coefficient of individual's i life satisfaction interacted with the job satisfaction of the j members is significant.

The results given in the second table show an opposite and significant effect on the individual happiness probability since an increasing within-family unhappiness with job affects negatively the members' probability of becoming happier with life. This result complies with the intuitive approach of the table 1 but with opposite signs. Again, the puzzling result is reinforced by the interaction terms between the job dissatisfaction and the family size. It is shown in table 1 that the dissatisfaction only has a positive impact in case of household size is equal to 2. That is to say, couples without children.

Regarding the impact on the divorce probability, it is found interesting to notice effects of the predicted happiness and unhappiness, respectively, are not symmetric. On the contrary, while happiness seems to significantly decrease the probability of divorce (see table 3). Happy individuals seems, whatever gender it is considered, tend not to divorce comparing to the others (table 4 and 5).

Interestingly, these results are totally insignificant when considering the sample of individuals who are keen on becoming unhappy because their family members feel badly with their job (see table 6, 7 and 8).

Table 1 Conditional Logit (with heterogeneity) of individual life satisfaction with within-household job satisfaction.

Life Satisfaction	Coef.	Std. Dev
JS transmission	0.575***	0.07
age	-0.084***	0.032
age2	0.001**	0.000
female	0.015	0.085
Male		Ref
single	-0.224**	0.098
widowed	-1.328**	0.644
divorced	-0.423**	0.199
Married		Ref
foreigner	-0.324*	0.167
French		Ref
Rural	0.294***	0.089
Urban less than 20000	0.201***	0.101
Urban 20 to 100000	0.026	0.115
Paris	-0.201*	0.113
Urban >200000 and <1000000		Ref
Temporary	-0.204*	0.118
Permanent		Ref
part time	-0.239**	0.105
Full time		Ref
Weekly Contracted Hours	-0.029***	0.004
Weekly wage	9 ^e 10-5***	1.8 ^e 10-6
High Education		Ref
Middle education	-0.086	0.097
Low education	-0.293**	0.116
Crafts	-0.009	0.332
White collar	0.156	0.113
Employee	-0.057	0.095
Blue collar	-0.368***	0.104
Intermediate workers		Ref
Family_size2	0.494***	0.103
Family_size3	-0.008	0.091
Family_size4		Ref
Family_size5	-0.002	0.112
Family_size6	-0.512	0.404
Family_size7	0.203	0.156
JS transmission*F_size2	-0.214**	0.097
JS transmission*F_size3	-0.066	0.099
JS transmission*F_size4		Ref
JS transmission*F_size5	0.075	0.146
JS transmission*F_size6	0.694	0.680
JS transmission*F_size7	-0.049	0.153
Number of visits to physicians	-0.209***	0.022
Intercept	0.954	0.691

Log likelihood	-9254.6
marginal effects	-2.428
N of individuals	23367
Number of groups	5591

***/**/* indicate statistical Significance at 1, 5 and 10 percent level respectively.

Family size2 : household without any children , Family size3 : with one child, Family size4: with 2 children, Family size5 : with more than 3 children, Family size6: with one parent only, Family size7: other type.

We control also for Sector dummies (16) and Year dummies (8).

Table 2 Conditional Logit (with heterogeneity) of individual life satisfaction with within-household job dissatisfaction.

Life satisfaction	Coef.	Std. Dev
Job dissatisfaction transmission	-0.811***	0.128
age	-0.092***	0.027
age2	0.001***	0.000
female	0.017	0.074
Male	Ref	
single	-0.127	0.082
widowed	-1.135**	0.552
divorced	-0.207	0.163
married	Ref	
foreigner	-0.374***	0.143
French	Ref	
Rural	0.301***	0.079
Urban less than 20000	0.228***	0.088
Urban 20 to 100000	0.058	0.097
Paris	-0.268***	0.099
Urban >200000 and <1000000	Ref	
Temporary	-0.299***	0.093
Permanent	Ref	
part time	-0.293***	0.090
Full time	Ref	
Weekly Contracted Hours	-0.030***	0.003
Weekly wage*100	0.0011***	0.00016
High Education	Ref	
Middle education	0.005	0.086
Low education	-0.206**	0.102
Crafts	-0.173	0.275
White collar	0.086	0.099
Employee	-0.122	0.083
Blue collar	-0.423***	0.091
Intermediate workers	Ref	
Family_size2	0.361***	0.081
Family_size3	0.034	0.070
Family_size4	Ref	
Family_size5	-0.034	0.089
Family_size6	-0.623*	0.334
Family_size7	0.234*	0.121
Job diss*F_size2	0.329**	0.161
Job diss*F_size3	-0.217	0.269
Job diss*F_size4	Ref	
Job diss*F_size5	0.595	0.955
Job diss*F_size6	0.197	0.247
Job diss*F_size7	-0.186***	0.019
Number of Visits to physicians	-0.19***	0.02
intercept	1.55	0.56
Log likelihood	-11979.04	
marginal effects	-2.3401	

N of individuals	29488
Number of groups	6666

***/**/* indicate statistical Significance at 1, 5 and 10 percent level respectively.

Family size2 : household without any children , Family size3 : with one child, Family size4: with 2 children, Family size5 : with more than 3 children, Family size6: with one parent only, Family size7: other type .

We control also for Sector dummies (16) and Year dummies (8).

Table 3 Impact of the predicted happiness on the individuals' probability of the divorce for the whole sample

Divorce	Coefficient.	Std. Dev
Pr (happiness)	-1.48***	0.316
age	1.05***	0.164
age2	-0.01***	0.001
female	0.625*	0.330
foreigner	-2.82***	0.670
Rural	0.94**	0.406
Urban less than 20000	0.89**	0.425
Urban 20 to 100000	1.23***	0.463
Paris	0.295*	0.418
Temporary	-1.38**	0.611
part time	-0.99**	0.412
Weekly Contracted Hours	-0.05***	0.019
Weekly wage*100	0.021**	0.0089
Middle education	0.279*	0.459
Low education	0.942*	0.590
Crafts	0.802*	0.972
White collar	0.320*	0.452
Employee	0.139*	0.384
Blue collar	-1.45***	0.425
Number of Visits to physicians	-0.36***	0.099
Free Housing	-0.961*	0.610
Tenant	1.16***	0.331
Owner		Ref
Living in a House	-0.339*	0.302
Living in an Apartment		Ref
Family_size2	2.29***	0.359
Family_size3	0.215*	0.287
Family_size5	-0.77**	0.353
Family_size6	1.41***	0.485
Family_size7	-0.693*	0.579
intercept	-35.03***	3.690
Log likelihood	-1492.05	
N of individuals	23271	

Family size2 : household without any children , Family size3 : with one child, Family size4: with 2 children, Family size5 : with more than 3 children, Family size6: with one parent only, Family size7: other type .

We control also Year dummies (8).

The variable used in reference are the same as in tables 1 and 2.

Table 4: Impact of the predicted happiness on the individuals' probability of the divorce for the males sample

Divorce	Coefficient.	Std. Dev
Pr (happiness)	-1.61***	0.481
age	0.89***	0.206
age2	-0.01***	0.002
foreigner	-2.71***	0.892
Rural	2.06***	0.541
Urban less than 20000	1.87***	0.604
Urban 20 to 100000	1.97***	0.638
Paris	-0.274	0.553
Temporary	-2.270**	1.051
part time	-0.810*	0.971
Weekly Contracted Hours	-0.068**	0.031
Weekly wage*100	0.016	0.013
Middle education	0.273	0.536
Low education	0.021	0.616
Crafts	1.000	1.122
White collar	0.523	0.602
Employee	0.471	0.478
Blue collar	-1.84***	0.529
Visits to doctor	-0.39***	0.150
Free Housing	-1.264	0.862
Tenant	1.46***	0.424
Owner		Ref
Living in a House	-0.799	0.489
Living in apartment		Ref
Family_size2	2.60***	0.488
Family_size3	0.402	0.377
Family_size5	-1.373**	0.547
Family_size6	8.11***	1.623
Family_size7	-1.098	1.031
intercept	-32.76***	4.689
Log likelihood	-750	
N of individuals	12896	

Family size2 : household without any children , Family size3 : with one child, Family size4: with 2 children, Family size5 : with more than 3 children, Family size6: with one parent only, Family size7: other type .

We control also for Year dummies (8).

The variable used in reference are the same as in tables 1 and 2.

Table 5: Impact of the predicted happiness on the individuals' probability of the divorce for the females sample

Divorce	Coefficient.	Std. Dev
Pr (happiness)	-1.41***	0.422
age	1.51***	0.254
age2	-0.01***	0.003
foreigner	-1.784**	0.833
Rural	-0.413	0.538
Urban less than 20000	0.315	0.821
Urban 20 to 100000	1.29***	0.484
Paris	0.401	0.505
Temporary	-1.045	0.783
part time	-0.97***	0.542
Weekly Contracted Hours	-0.041	0.029
Weekly wage*100	0.029	0.016
Middle education	-0.235	0.514
Low education	0.665	0.597
Crafts	2.026	1.572
White collar	0.769	0.785
Employee	1.243	0.499
Blue collar	-0.258	0.832
Visits to doctor	-0.263*	0.138
Free Housing	1.116	1.388
Tenant	1.99***	0.419
Owner		Ref
Living in a House	0.176	0.437
Living in an Apartment		Ref
Family_size2	1.74***	0.516
Family_size3	-0.442	0.480
Family_size5	-0.916*	0.540
Family_size6	-0.164	0.544
Family_size7	-1.786*	0.997
intercept	-46.1***	6.044
Log likelihood	-699	
N of individuals	10375	

Family size2 : household without any children , Family size3 : with one child, Family size4: with 2 children, Family size5 : with more than 3 children, Family size6: with one parent only, Family size7: other type .

We control also for Year dummies (8).

The variable used in reference are the same as in tables 1 and 2.

Table 6 Impact of the predicted unhappiness on the individuals' probability of divorce for the whole sample.

Divorce	Coefficient.	Std. Dev
Pr (unhappiness)	0.036	0.229
age	0.82***	0.124
age2	-0.009***	0.002
female	1.25***	0.341
foreigner	-0.751	0.469
Rural	-0.464	0.305
Urban less than 20000	0.616*	0.334
Urban 20 to 100000	0.257	0.384
Paris	0.306	0.321
Temporary	-0.017	0.449
part time	-0.401	0.346
Weekly Contracted Hours	0.0003	0.014
Weekly wage*100	-0.003	0.008
Middle education	0.514	0.330
Low education	0.744*	0.397
Crafts	1.194	0.728
White collar	0.456	0.401
Employee	-0.032	0.301
Blue collar	0.299	0.375
Visits to doctor	0.056	0.083
Free Housing	-0.999**	0.489
Tenant	0.487**	0.243
House	-0.199	0.259
Family_size2	0.037	0.313
Family_size3	0.023	0.252
Family_size5	-0.291	0.314
Family_size6	2.72***	0.425
Family_size7	-0.699	0.487
intercept	-28.62***	2.78
Log likelihood	-1878.65	
N of individuals	23271	

Family size2 : household without any children , Family size3 : with one child, Family size4: with 2 children, Family size5 : with more than 3 children, Family size6: with one parent only, Family size7: other type .

We control also for Year dummies (8).

The variable used in reference are the same as in tables 1 and 2.

Table 7 Impact of the predicted unhappiness on the individuals' probability of divorce for the males sample.

Divorce	Coefficient.	Std. Dev
Pr (unhappiness)	-0.333	0.365
age	0.50***	0.154
age2	-0.005***	0.001
foreigner	-1.474**	0.716
Rural	-0.616	0.477
Urban less than 20000	-0.274	0.583
Urban 20 to 100000	0.250	0.465
Paris	0.997**	0.488
Temporary	0.567	0.723
part time	-0.398	0.676
Weekly Contracted Hours	-0.013	0.022
Weekly wage*100	-0.003	0.010
Middle education	1.812***	0.554
Low education	0.064	0.578
Crafts	1.443	1.072
White collar	-0.064	0.575
Employee	0.885*	0.482
Blue collar	0.576	0.433
Visits to doctor	-0.107	0.126
Free Housing	0.056	0.882
Tenant	1.010***	0.387
House	-1.127***	0.408
Family_size2	0.249	0.416
Family_size3	0.153	0.317
Family_size5	-0.702	0.525
Family_size6	9.17***	1.214
Family_size7	-0.498	0.622
intercept	-23.94**	3.250
Log likelihood	-970.86	
N of individuals	12896	

Family size2 : household without any children , Family size3 : with one child, Family size4: with 2 children, Family size5 : with more than 3 children, Family size6: with one parent only, Family size7: other type .

We control also for Year dummies (8).

The variable used in reference are the same as in tables 1 and 2.

Table 8 Impact of the predicted unhappiness on the individuals' probability of divorce for the females sample.

Divorce	Coefficient.	Std. Dev
Pr (unhappiness)	0.335	0.297
age	1.41***	0.227
age2	-0.02***	0.002
foreigner	-1.339	0.860
Rural	0.328	0.494
Urban less than 20000	0.662	0.599
Urban 20 to 100000	0.94*	0.524
Paris	0.85*	0.510
Temporary	-0.144	0.631
part time	0.270	0.459
Weekly Contracted Hours	0.04*	0.022
Weekly wage*100	0.016	0.017
Middle education	-0.079	0.590
Low education	1.305**	0.659
Crafts	1.257	1.408
White collar	1.170*	0.668
Employee	1.026**	0.490
Blue collar	1.471*	0.783
Visits to doctor	0.131	0.111
Free Housing	-0.269	1.140
Tenant	0.547	0.406
House	-0.532	0.461
Family_size2	1.45***	0.496
Family_size3	0.200	0.386
Family_size5	0.258	0.453
Family_size6	2.00***	0.535
Family_size7	-0.909	0.788
intercept	-42.30***	5.308
Log likelihood	-879.406	
N individuals	10375	

Family size2 : household without any children , Family size3 : with one child, Family size4: with 2 children, Family size5 : with more than 3 children, Family size6: with one parent only, Family size7: other type .

We control also for Year dummies (8).

The variable used in reference are the same as in tables 1 and 2.

5. Concluding Remarks

Following many research papers in subjective well-being individual's Life satisfaction is found to be affected by the socio-demographic and economic variables. Not only is affected her/his life satisfaction by the commonly known range of factors but the model developed above has sought to show that reported Job satisfaction of the rest of the family members modifies the individual's propensity to become happy with her/his life. It is found that since the model tries to incorporate an epidemiological structure, there is a significant of within-family job satisfaction transmission on the individual happiness probabilities. Second, the size of the family plays an important role in explaining how the spread of the job satisfaction occurs. Finally, the predicted values of happiness/unhappiness probabilities equivocally influence the probabilities of divorce. Indeed, in one hand individuals who are affected positively by their within-family job satisfaction, tend to decrease their will to divorce in case they wish to. On the reverse side, unhappy households seem not to be affected at all, whatsoever the considered sample.

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