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**Working Paper**

## Are happiness and productivity lower among university students with newly-divorced parents? An experimental approach

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# **Are Happiness and Productivity Lower among University Students with Newly-Divorced Parents? An Experimental Approach**

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## ABSTRACT

### **Are Happiness and Productivity Lower among University Students with Newly-Divorced Parents? An Experimental Approach<sup>\*</sup>**

We live in a high-divorce age. It is now common for university faculty to have students who are touched by a recent divorce. It is likely that parents themselves worry about effects on their children. Yet there has been almost no formal research into the important issue of how recent parental-divorce affects students at university. This paper designs such a study. In it, to avoid 'priming', we measure students' happiness with life before we inquire into their family background. We also measure student achievement in a randomized-trial productivity task. Our results seem both of scientific interest and of potential interest to parents. This study finds no evidence that students suffer after parental divorce

JEL Classification: D03, J24, C91

Keywords: labor productivity, divorce, well-being, happiness, experimental economics

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This paper is a study of divorce and its consequences for grown children. It builds on, and is complementary to, a branch of modern work such as Collishaw et al (2007) that suggests smaller negative effects than used to be believed in an earlier era. The analysis appears to be the first of its kind: it uses an experimental setup to try to understand the influence of parental divorce on university students.

A large early literature on the impact of divorce on children was unambiguous in finding a correlation between lower academic achievement (and a reduced ability to internalize problems) and divorce -- a literature such as Amato (2001). Within psychology, there is also research on the duration of such effects. While much of the literature confirms that in the short-run the impact is indeed greater (see Lansford, 2009), there is some scope for the effect to be maintained well into adulthood. To put this in context, Lansford (2009) stresses the need to control for socio-economic status and argues that the lack of controls may be overstating the negative tone of the conclusions prevalent in the psychology literature.

In recent years, economists have added to the literature -- almost invariably finding that divorce does not have the scale of impact indicated within much of the psychology literature. Gruber (2004) employs cross-country data to assess the impact of the change of US divorce regulation on children's long-term achievement, and similarly González and Viitanen (2008) test the difference in regulation for EU countries. Both find a sizable and negative impact of divorce on young people. Sanz-de-Galdeano and Vuri (2007) draw upon data from the National Education Longitudinal Study, and control for the potential endogeneity of parental divorce by employing double and triple difference models that relied on observing teenagers from intact and divorced backgrounds before and after the divorce occurred, and found that parental divorce did not negatively affect teenagers' cognitive skills. Their results suggest that cross-sectional estimates overstate the detrimental effect of parental divorce. Liu (2007) and Piketty (2003) use individual data to test the relationship between divorce and children's education attainments; both conclude that it is not the divorce per se generating lower attainments but the environment before the divorce. Similar conclusions are reached by Hoekstra (2009) with district-based data on divorce.

From an economist's perspective, we might be interested in the direct question of whether and to what extent parental divorce negatively impacts on children's ability to perform well in education, and later via their productivity in the workplace, for long-run earnings. At the macroeconomic level, this might even translate into a desire to understand what high divorce rates could do to economic growth through the potential effect on the children of divorced parents.

We seek to contribute to this literature. We use a rather different methodology than earlier writings.

This study constructs a laboratory experiment in which we can directly observe performance in a paid task and relate this to each subject's recent experience (or not) of parental divorce. While our methodology differs from that of other scholars, our results are in alignment with some recent econometric work in indicating a less worrying impact of parental divorce on children's abilities. For our own study, we use subjects who are college students, which is an interesting group in that they are at the start of adulthood (in the age range 18-21) and for many the experience of parental divorce is recent (1-3 years).

In an anonymous UK university, we designed and conducted a laboratory experiment in which subjects -- all of whom were students -- were asked to carry out *a task designed to measure their productivity and their ability to concentrate*. Afterwards the subjects revealed if and when their parents were divorced.

The full set of experimental instructions is provided in the Appendix. To summarize the design of the experiment: we first asked subjects to enter their happiness level on a seven point scale into a spreadsheet. A copy of the question is found in the Appendix. They were then asked to carry out two paid piece-rate tasks. They had 10 minutes to add as many sets of numbers together as they could. Each set of numbers consisted of 5 two-digit numbers; for example, one such problem might have been:

51	14	74	33	85	
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They were paid 25p for each correct addition; hence they had a monetary incentive to correctly add as many as they could within the 10 minutes. This task also allowed us potentially to distinguish between the raw number of attempts and the percentage that

are calculated correctly (which will both matter in terms of payment). The second task was a short GMAT-style test designed to help control for intelligence, a copy of which is provided in the Appendix. Finally, they completed a long questionnaire which included questions about recent parental divorce and numerous other useful control variables (designed to generate socio-economic data, and further background data about each subject). A copy of the questionnaire is provided in the Appendix. We carried out the experiment over 3 days, with 12 sessions and 269 subjects. No subject was allowed to participate more than once and none was allowed to have ever taken part in a similar experiment before. Table 1 presents a full description of the data and is provided in the Appendix together with the other tables referenced in the text. While the great majority of subjects completed the questionnaire in full, we could not coerce them into doing so, and therefore we do not have a full set of 269 observations for every questionnaire answer, although we always have more than 250. The laboratory subjects were students from all across the faculties of the university. Advertisements were posted widely. To help anonymity, subjects were not asked which degree course they followed.

The regression variables are defined in the following way.

*Divorce1* represents the subjects whose parents had divorced in the last 3 years and *Divorce2* the subjects where the divorce happened in the last 5 years. Finally *Divorce3* represents the subjects whose parents had divorced in the 3 years before they began university. There is overlap between these. Our aim is to explore different groupings.

*Happybefore* is the level of happiness reported by the subjects at the beginning of the experiment (and lies on a 7-point scale). *High School Grades* is calculated from the ratio of top grades to the total of school-level subjects studied, and so is a control for overall ability. *Gmat* is the result from a short 4-question GMAT-style test performed as the second task, and is viewed as a control for innate ability. *Additions* is the number of correct additions performed in 10 minutes during the main task.

It seems particularly important here to avoid ‘priming’, namely, to avoid reminding students of good or bad things and then immediately asking them questions about

their feelings of well-being. This is why we measure students' happiness with life at the start before we ask any other questions.

As shown previously in Oswald, Proto and Sgroi (2009), the level of happiness measured at the beginning of such an experiment is sensitive to life events declared *ex post* by subjects. That work examined illness among close family members or family bereavement. Large statistical effects were found from these life events.

As can be seen in Table 2, the association between parental divorce and subjects' happiness is not negative. If anything, it is weakly positive. In specification 1 the sign is positive though not significant at the 5% level. In other specifications, the coefficient is only marginally affected by adjustment for other factors (eg, the inclusion of demographic controls and skill variables).

In column 3 of Table 2, we have added variables for *High School Grades*, *Gmat* and *Additions* -- all to control for the possibility of an omitted variable linked to the personal qualities of divorced parents which might also somehow be reflected in their children. In columns 3 and 4, we present regressions separately for male and female. We actually observe a weakly significant positive sign among male subjects.<sup>1</sup>

Table 3 performs a different exercise. Its focus is productivity. Hence Table 3 has the number of correct additions under timed pressure in the laboratory, *Additions*, as the dependent variable. The spirit of the results is similar to those found in Table 1: divorce seems to have no discernible deleterious effect on subjects' ability to perform. Interestingly, the sign seems to be, if anything, positive and the coefficient is similar for male and female subjects (as in columns 4 and 5 of Table 3). Again, there is no negative association with parental divorce.

In Table 4 and Table 5, we again estimate happiness and additions equations, but now we take variable *Divorce2* -- divorces over a longer prior period -- as the key independent variable. We find the same result. There is no association between parental divorce and subjects' happiness or their performance in the additions task.

As a variant, Table 6 uses *High School Grades*, the ratio of top grades over the total school-level subjects studied, as a dependent variable. Here we regress this variable

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<sup>1</sup> We also ran the same regression using an ordered probit model. Results were similar. It is interesting to note that for the male happiness regression *divorce1* then becomes positive and significant at the 5% level.



against Divorce3 -- representing the subjects whose parents have divorced in the 3 years before the first year of university. In that way, we aim to assess the effect of parental divorce during the high-school years up to the exam A-levels used for entry into university. Divorce3 has statistically insignificant effects in all specifications of the model.

It should perhaps be emphasized that -- as will be clear in the details of the paper's tables -- the finding of no damaging effect from parental divorce is not simply because of Type II errors or any repeated failure to reject the null of zero on a negative coefficient. The coefficients are typically positive rather than negative.

A further check was done. We constructed an alternative divorce variable (Divorce4 - - results not shown). This measured the period of divorce symmetrically in the sense that the length of time, regardless of which year of college the students were in, was always equivalent to whether their parents had divorced in the three-year period before the exact year of observation. The results were the same.

Our study cannot hope to be the last word on this complex subject. Divorce is not randomly assigned in the world, so this is a difficult area in which to do social-science research. The necessary maintained assumption in our work -- as in Corak 2001 -- is that what happens to the parent is not innately passed on, through genes or some other mechanism, to the child's happiness and productivity.

We started this study expecting to discover some harmful consequences, from recent parental divorce, for the happiness and productivity levels of university students. We were unable to find such evidence.

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## Appendix

**Table 1**  
**Descriptive Statistics for the Sample of 269 Laboratory Subjects**

VARIABLES	Observations	Mean	Std. Dev.	Min	Max
Happybefore	269	4.8438	.9412	2	7
Divorce1	269	.06319	.2437	0	1
Divorce2	269	.08921	.2855	0	1
Divorce3	269	.0483	.2148	0	1
Age	259	19.6100	1.5472	18	30
Male	261	.5210	.5005	0	1
High School	255	.5354	.2560	0	1
Grades					
Gmat score	269	3.6096	1.4660	0	5
Additions	269	17.9665	7.0049	0	50

**‘Happybefore’ is the student’s reported happiness (on a scale from 1 to 7) at the start of the whole experiment. ‘Divorce1-3’ are alternative variables for the recency of parental divorce. ‘Additions’ is the number of correct numerical additions in the timed productivity task in the laboratory.**

**Table 2****Regression Equations in which Students' Happiness is the Dependent Variable – with a Variable for Parental Divorce in the Last 3 Years**

	(1) Happybefore	(2) Happybefore (Demogr. controls)	(3) Happybefore (Skills and demogr. controls)	(4) Happybefore (Male sample)	(5) Happybefore (Female sample)
Divorce1	0.417* (0.246)	0.383 (0.249)	0.336 (0.250)	0.618* (0.317)	-0.364 (0.428)
Age		-0.0571 (0.0395)	-0.0658 (0.0411)	-0.0984 (0.0628)	-0.0211 (0.0563)
Male		0.0533 (0.123)	0.0402 (0.130)		
High School Grades			0.0447 (0.250)	-0.415 (0.351)	0.366 (0.357)
Gmat score			-0.0207 (0.0458)	0.0674 (0.0712)	-0.103* (0.0600)
#Additions			0.00484 (0.00964)	0.0119 (0.0120)	-0.00160 (0.0174)
Session Dummies	Yes	Yes	Yes	Yes	Yes
Constant	4.693*** (0.216)	5.832*** (0.834)	5.987*** (0.928)	6.681*** (1.396)	5.189*** (1.276)
Observations	269	259	254	134	120
R-squared	0.062	0.073	0.073	0.178	0.140

Here, and in later tables, the numbers in parentheses are standard errors.

\* is significance at 10%; \*\* at 5%; \*\*\* at 1%.

**Table 3**

**Regression Equations in which Students' Productivity in a Laboratory Task is the Dependent Variable – with a Variable for Parental Divorce in the Last 3 Years**

	(1) Additions	(2) Additions (Demogr. controls)	(3) Additions (Skills and demogr. control)	(4) Additions (Male sample)	(5) Additions (Female sample)
Divorce1	3.062* (1.792)	2.747 (1.751)	2.305 (1.679)	3.106 (2.409)	3.681 (2.384)
Age		-0.324 (0.278)	-0.0797 (0.277)	0.00246 (0.481)	-0.109 (0.317)
Gmat score			1.213*** (0.299)	1.345** (0.531)	0.931*** (0.326)
Male		1.238 (0.864)	0.0436 (0.876)		
High School Grades			2.810* (1.676)	2.446 (2.680)	2.590 (1.997)
Session Dummies Constant	Yes 16.68*** (1.572)	Yes 22.86*** (5.864)	Yes 12.45** (6.205)	Yes 6.598 (10.67)	Yes 15.87** (7.021)
Observations	269	259	254	134	120
R-squared	0.100	0.109	0.177	0.182	0.337

**Table 4****Regression Equations in which Students' Happiness is the Dependent Variable – with a Variable for Parental Divorce in the Last 5 Years**

	(1) Happybefore	(2) Happybefore (Demogr. controls)	(3) Happybefore (Skills and demogr. control)	(4) happybefore (only male)	(5) happybefore (only female)
Divorce2	0.206 (0.208)	0.182 (0.210)	0.154 (0.211)	0.314 (0.273)	-0.119 (0.349)
Age		-0.0591 (0.0396)	-0.0667 (0.0413)	-0.0945 (0.0634)	-0.0171 (0.0565)
Male		0.0601 (0.123)	0.0448 (0.130)		
High School Grades			0.0561 (0.251)	-0.401 (0.355)	0.365 (0.359)
Gmat score			-0.0197 (0.0460)	0.0787 (0.0719)	-0.0996 (0.0601)
Additions			0.00545 (0.00965)	0.0124 (0.0122)	-0.00370 (0.0173)
Session Dummies	Yes	Yes	Yes	Yes	Yes
Constant	4.715*** (0.216)	5.891*** (0.835)	6.002*** (0.931)	6.645*** (1.411)	5.135*** (1.284)
Observations	269	259	254	134	120
R-squared	0.055	0.067	0.068	0.161	0.135

**Table 5**

**Regression Equations in which Students' Productivity in a Laboratory Task is the Dependent Variable – with a Variable for Parental Divorce in the Last 5 Years**

	(1) Additions	(2) Additions	(3) Additions	(4) Additions
Divorce2	1.540 (1.480)	1.679 (1.415)	3.628* (2.030)	0.376 (1.983)
Age	-0.337 (0.278)	-0.0810 (0.278)	0.00770 (0.478)	-0.172 (0.320)
Gmat score		1.228*** (0.299)	1.414*** (0.526)	0.916*** (0.329)
Male	1.279 (0.866)	0.0553 (0.877)		
High School Grades		2.913* (1.677)	2.550 (2.662)	2.616 (2.021)
Session Dummies	Yes	Yes	Yes	Yes
Constant	23.23*** (5.871)	12.43** (6.216)	5.986 (10.61)	17.19** (7.099)
Observations	259	254	134	120
R-squared	0.104	0.176	0.192	0.322

**Table 6****Regression Equations in which Students' High School Performance is the Dependent Variable – with a Variable for Parental Divorce in the 3 Years before University**

	(1)	(2)	(3)	(4)	(5)
	High School Grades	High School Grades	High School Grades	High School Grades	High School Grades
Divorce3	-0.0048 (0.0737)	-0.0093 (0.0727)	-0.0039 (0.0711)	-0.0020 (0.0928)	-0.0223 (0.1260)
Age		-0.0336*** (0.0107)	-0.0273** (0.0106)	-0.0259 (0.0163)	-0.0267* (0.0152)
Gmat score			0.0392*** (0.0113)	0.0445** (0.0176)	0.0304* (0.0156)
Male		-0.0199 (0.0332)	-0.0514 (0.0337)		
Session Dummies	Yes	Yes	Yes	Yes	Yes
Constant	0.510*** (0.0587)	1.194*** (0.225)	0.933*** (0.232)	0.915** (0.356)	0.914*** (0.330)
Observations	255	254	254	134	120
R-squared	0.065	0.103	0.146	0.189	0.164



## Subject Instructions

[Subjects are invited to enter the lab]

Welcome to the session. You will be asked to perform a small number of tasks and will be paid both a show-up fee (of £5) and an amount based on how you perform. Please do not talk to each other at any stage in the session. If you have any questions please raise your hands, but avoid distracting the others in the room.

You will now receive ID cards and you are asked to sit at the computer corresponding to the ID number. Everything is done anonymously – your performance will simply be recorded based on the ID card, and not your names. You will find some paper and a pen next to your computer – use them if you wish. Please do not use calculators for any of today's tasks as this will be classified as cheating. If we observe cheating it will invalidate your answers and you will be disqualified resulting in no payment being made.

First of all please maximize the file called “Intro” and complete the question as indicated. Once you have done this, please save and close the file.

[This is not timed, but typically takes 1-2 minutes]

Look away from your screens for a moment. You will next have 10 minutes to add a sequence of numbers together and enter your answers in a column labelled “answer”. You will be paid based on the number of correct answers that you produce at a rate of 25p per correct answer. When the ten minutes are up I will ask you to stop what you are doing. When asked to stop please leave the software open on you screens as we will need to visit your computers to save your work and prepare your next task. Now look at your screens. You will find that a file called “Number Additions” is open but minimized on your screen. Please now open the file by clicking on the tab. You have ten minutes!

[10 minutes]

Please stop what you are doing. We will now visit your computers and save your work. We will also place a sheet faced down next to your keyboards. Please do not turn over the sheet until I ask.

[Move to consoles, save work and distribute GMAT-style test sheets]

For the second task we would like you answer a small number of questions. You will see that the file in front of you allows you to enter a letter from “a” to “e”, corresponding to a multiple-choice answer. Your payment depends upon how many you get correct at a rate of 50p per correct answer. Please turn over the sheets and begin. You have 5 minutes to attempt these questions.

[5 minutes]

Please stop what you are doing. We will once again visit your computers and save your work and prepare a questionnaire for you to answer.

[Move to consoles, save work and open the questionnaire]

I would now like to ask you complete the questionnaire which should be open in front of you on your allocated computer. It is vital for our research that you answer as honestly as you can, and I would like to stress to you that as with the rest of your input today, your questionnaire answers are entirely anonymous: we will only link your answers to the specific computer ID which you were randomly allocated at the start of today's proceedings. I would also like to stress that your payment does not depend upon your questionnaire answers. Completing the questionnaire is not a timed event, so please do not feel the need to rush. If you have any questions concerning the questionnaire or if anything is not clear please raise your hands and someone will come over and attempt to deal with your question. When you are done please save the questionnaire and then close Excel and wait a moment for the others to finish and to await further instructions.

[This is not timed, but typically takes 10 minutes or so]

Hopefully you have all had a chance to complete the questionnaire. If you need more time, then please raise your hand. If everyone has completed their questionnaires, please make sure it is saved and close Excel.

Now please leave the pen on your desk but bring all of the paper which was distributed with you (the test paper and the scrap paper) which we will destroy. It is essential that you bring your computer ID card when you come up for payment as it is only through this card that we can administer payment. You will also need to sign a receipt. Please now form an orderly queue to the side of the room and keep some distance from the person at the front while they are being paid.

Many thanks for taking part in today's session!

[Payments handed out and receipts signed]

### GMAT-Style Test

[This is the second paid task, undertaken after the numerical additions]

Please answer these by inserting the multiple choice answer a, b, c, d or e into the GMAT MATH spreadsheet on your computer.

1. Harriet wants to put up fencing around three sides of her rectangular yard and leave a side of 20 feet unfenced. If the yard has an area of 680 square feet, how many feet of fencing does she need?

a) 34

b) 40

c) 68

d) 88

e) 102

2. If  $x + 5y = 16$  and  $x = -3y$ , then  $y =$

a) -24

b) -8

c) -2

d) 2

e) 8

3. If “basis points” are defined so that 1 percent is equal to 100 basis points, then 82.5 percent is how many basis points greater than 62.5 percent?

a) .02

b) .2

c) 20

d) 200

e) 2,000

4. Which of the following best completes the passage below?

In a survey of job applicants, two-fifths admitted to being at least a little dishonest. However, the survey may underestimate the proportion of job applicants who are dishonest,

because—.

a) some dishonest people taking the survey might have claimed on the survey to be honest.

b) some generally honest people taking the survey might have claimed on the survey to be dishonest.

c) some people who claimed on the survey to be at least a little dishonest may be very dishonest.

d) some people who claimed on the survey to be dishonest may have been answering honestly.

e) some people who are not job applicants are probably at least a little dishonest.

5. People buy prestige when they buy a premium product. They want to be associated with something special. Mass-marketing techniques and price-reduction strategies should not be used because —.

a) affluent purchasers currently represent a shrinking portion of the population of all purchasers.

b) continued sales depend directly on the maintenance of an aura of exclusivity.

c) purchasers of premium products are concerned with the quality as well as with the price of the products.

d) expansion of the market niche to include a broader spectrum of consumers will increase profits.

e) manufacturing a premium brand is not necessarily more costly than manufacturing a standard brand of the same product.

## Happiness Question

[Subjects answered this question prior to undertaking any of the paid tasks]

### Happiness

How would you rate your happiness at the moment? (1-7)

**Note: 1 is completely sad, 2 is very sad, 3 is fairly sad, 4 is neither happy nor sad, 5 is fairly happy, 6 is very happy, 7 is completely happy**

## Questionnaire

[Subjects completed this at the end of the experiment, after completing the two paid tasks]

Please insert your answers into the shaded boxes to the right: please scroll down until you have reached the end of the questionnaire as indicated.

### Details

What is your age?

Are you a 1st year, 2nd year, 3rd year, graduate student, or other? (1/2/3/G/O)

What is your gender? (M/F)

### School Record

Have you taken GCSE or equivalent in maths? (yes/no)

IF SO:

What was the highest grade possible for this course? (A/A\*/etc.)

What was your grade?

Give a percentage if you know it

Have you taken A-level or equivalent in maths? (yes/no)

IF SO:

What was the highest grade possible for this course?

What was your grade?

Give a percentage if you know it

How many school level qualifications have you taken (including GCSEs, A-levels and equivalent)?

How many of these qualifications were at the best grade possible? (eg A\* in GCSE, A is A-level, etc.)

**University Record**

Are you currently or have you ever been a student (yes/no)


If yes, which degree course(s)?

IF you are a second or third year student what class best describes your overall performance to date? (1/2.1/2.2/3/Fail)


IF you are a third year AND took part in the room ballot, were you allocated a room on campus?

**General Questions**

*Life has its ups and downs. During the last 5 years, have you experienced any of the following events (yes/no).*

*If yes, please could you indicate how many years ago in the second column to the right.*

*For example, if this happened this year enter 0, for a year ago enter 1, etc. up to 5 years ago.*

A bereavement in your close family? (e.g. parent/guardian, sibling)

A bereavement in your extended family? (e.g. close grandparent, close aunt/uncle, close cousin, close friend)

A parental divorce?

A serious (potentially life-changing or life-threatening) illness in your close family?

yes/no	number of years ago

Has anyone close to you had anything really good happen to them within the last 5 years? (yes/just averagely good/no)

yes/just averagely good/no	number of years ago

On a five point scale, how competitive or cooperative do you consider yourself with regard to others,

where '1' is 'Predominantly competitive' and '5' is 'Predominantly cooperative'?

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How often do you think you make comparisons between yourself and others? (often/sometimes/never/don't know)

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On a five point scale, how important do you consider social status, where '1' is 'Not at all important' and '5' is 'Very important'?"

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All things considered, how satisfied are you with your life as a whole these days?

where 1 means you are "completely dissatisfied" and 10 means you are "completely satisfied".

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