Living arrangements after separation and adolescent cognitive and socio-emotional skills

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Background

Longstanding research shows negative associations between parental divorce and different child outcomes. Child outcomes studied include physical health, socio-emotional and mental well-being, cognitive and educational outcomes, and, in adulthood, own socio-economic position, employment and earning situation, etc (Amato, 2001, 2005; Bzostek & Berger, 2017; Cherlin, 1999; Lacey, Bartley, Pikhart, Stafford, & Cable, 2014; Magnuson & Berger, 2009; Osborne & McLanahan, 2007). While researchers have stressed the importance of the heterogeneity of these adverse effects (Amato 2000), much of the literature tends not to distinguish between the various post-separation living arrangements.

While mother-sole custody has been the dominant living arrangement for children post-separation, across Western countries we now observe a growing heterogeneity in living arrangements for children experiencing parental separation, with an increase in children living within a reconstituted family or in a shared custody arrangement (Cancian et al. 2014). Initially mostly used by a small, selected group of socio-economically advantaged parents, shared custody is becoming more common, and the families using it are more diverse (Meyer et al. 2017; Kitterød and Wiik 2017). In France, as in several other European countries, the proportion of recent divorces with a shared custody arrangement now implicates about one in five divorces (19%, Guillonneau and Moreau 2013). Furthermore, the diversification of post-separation living arrangements of children can be seen through the increase in children living in within reconstituted families, which represent 9% of families in France (Lapinte 2013). Furthermore, France provides an interesting case study of a setting where a relatively generous welfare system, especially protective of single and working parents, may alleviate the adverse consequences of parental separation.

Cognitive skills are among the most important determinants of future socio-economic status, and crucial in understanding the mechanisms producing diverging trajectories. Non-cognitive domains have been less explored, however social and emotional competence, as well as being an important element of child well-being per se, has been shown to be a critical element of academic achievement, as it is linked to academic engagement and long-term academic achievement (Durlak et al., 2011). Several studies cite social and emotional skills as fundamental to students' level of engagement in secondary school, access to and completion of a tertiary degree, and their workplace trajectories (National Research Council, 2012).

Aim and hypotheses

In this paper, we exploit the increasing diversity in post-separation living arrangements in France, to ask **whether various post-divorce living arrangements have a differential impact on teenagers's cognitive and non-cognitive skills**. We include shared custody arrangements, an increasingly important phenomenon that has not yet enough empirical attention. As child outcomes are strongly impacted by socio-economic background and could reflect a selection process into separation, we apply a fixed effects framework.

Taking account of different types of post-parental separation living arrangements, and different types of adolescent outcomes, allows testing a number of hypotheses. First, if a potential mechanism underlying the relationship between parental separation and child outcomes is that the child receives less parental time and support due to the departure of the non-custodial parent, the negative effect of divorce on child outcomes should be smaller in shared custody relative to sole custody arrangements. On the reverse, one could hypothesise that living between two households could be detrimental to children if they incur in extra time costs going between homes and having to organise their schoolwork between two homes. Second also expect that parental divorce could potentially affect both cognitive and non-cognitive outcomes, but probably through different mechanisms. While in the early years both cognitive and non-cognitive skills are highly malleable, during the adolescent years, non-cognitive skills are more malleable than cognitive skills. We can therefore hypothesize a stronger effect of parental separation on non-cognitive rather than cognitive skills. Third, we hypothesize that differences in cognitive skills gaps may be explained more by variables such as parental education and household financial resources, as well as factors such as the home learning environment. On the other hand, we expect non cognitive skills to react more to other household characteristics such as parental relationship quality and conflict, while less impacted by classic socio-economic variables.

Data and variables

The Panel of Pupils 2007, carried by DEPP ("*Direction de l'évaluation, de la prospective et de la performance*" of the French Ministry of Education), is a random, representative sample[1] of 35 000 children starting secondary school, *collège*, in France in autumn 2007. In the French school system, students generally enter *collège* at the age of 11 and finish four years later, before going to upper secondary school (*lycée*). At the end of the academic years 2007/08 and 2010/11, he sampled children took a number of tests covering different dimensions of cognitive skills. Additionally, the children were asked to answer questions regarding their own perceived self-efficacy in various settings at both waves of data collection. These tests were supplemented by two detailed surveys of the child's family environment, filled in 2007 and 2011 by the child's main carer, which allows observing a variety of family characteristics.

The child outcomes analysed here are based on tests and questionnaires developed by the DEPP with external researchers, and are mostly based on already existing tests that have been widely used in research (Trosseille et al. 2013). While some examine classic subjects such as maths, grammar and reading, others test encyclopaedic knowledge, logical reasoning, and phonology and are not necessarily linked to the content of the school curriculum. Beyond these six school-related competencies, three non-cognitive outcomes were constructed from the 37 questions which addressed perceived self-efficacy relating to various domains of a child's daily life; these questions were based on the work of Bandura (1990). Using principal component analysis, three underlying factors were identified: perceived self-efficacy in their school abilities, in peer-relations, and in terms of autoregulation.

The key variable of interest is the family structure and the type of living arrangement adapted in case of parental separation, in 2008 and 2011. Each household was asked whether the child lived (with his/her) 1) mother and father, 2) in shared custody, 3) single mother, 4) single father, 5) mother and step-parent, 6) father and stepparent, 7) another family member, 8) within a social institution, or 9) in another situation. We control for child characteristics (sex, birth order, whether he/she had ever repeated a grade), family background (parental educational attainment, total household income, number of siblings, place of residence, citizenship status, language used at home), and the type of school (private/public; located in a designated disadvantaged area).

In 2008, when children are around 11 years old, 76% of them live with both parents, 13% with their mother only, 6% with their mother and step father, and 3% are in shared custody arrangements, and around 2% live with their father and eventually a step-mother. Four years later, the proportion of nuclear family households diminished, while the proportion of those living within a sole custody or in shared custody arrangement increased (Table 1).

Table 1: Family structure in 2008 and 2011

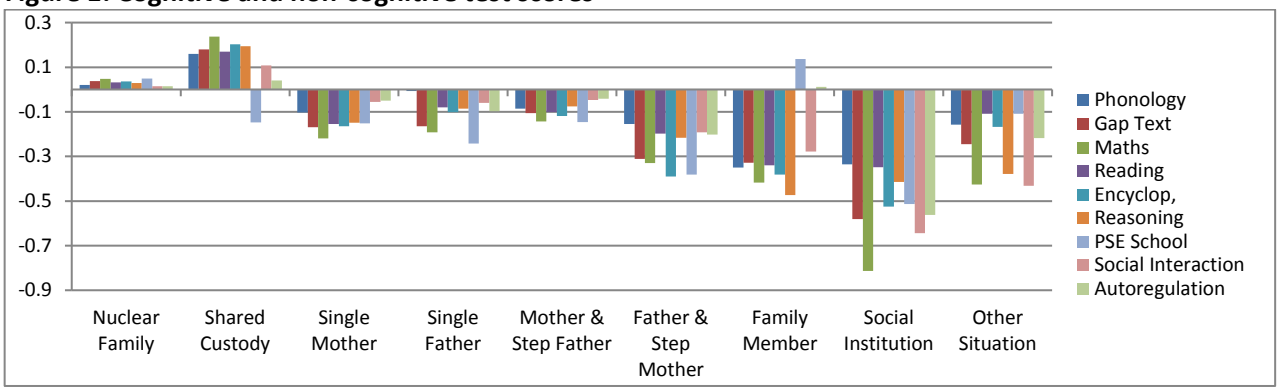
	2011										
2008	Nuclear Family	Shared Custody	Single Mother	Single Father	Mother & Step Father	Father & Step Mother	Family Member	Social Institution	Other Situation	Total (freq)	**Total (%)**
Nuclear Family	16058	261	626	114	77	19	3	8	17	17183	**75,9%**
Shared Custody	27	457	114	36	69	23	0	0	2	728	**3,2%**
Single Mother	87	99	2264	38	327	38	16	10	9	2888	**12,8%**
Single Father	7	12	12	150	8	41	5	3	4	242	**1,1%**
Mother & Step Father	36	32	215	12	945	22	2	3	4	1271	**5,6%**
Father & Step Mother	9	7	10	10	9	115	2	0	1	163	**0,7%**
Family Member	7	1	6	2	1	0	40	2	6	65	**0,3%**
Social Institution	4	0	0	1	3	1	0	41	1	51	**0,2%**
Other Situation	4	3	13	1	5	2	1	5	6	40	**0,2%**
Total (freq)	16239	872	3260	364	1444	261	69	72	50	**22631**	
Total (%)	**71,8%**	**3,9%**	**14,4%**	**1,6%**	**6,4%**	**1,2%**	**0,3%**	**0,3%**	**0,2%**		100%

[1] 98% of all the public and private French *collèges* are included with an average of five students per school.

Results

Whatever the outcome considered (Figure 1), we usually observe that children living within a shared custody arrangement in 2008 are those who perform best in the cognitive tests (the same is observed for 2011, not shown). This is also the case for the non-cognitive outcomes, with the exception of self-efficacy in school abilities. As expected, this is related to the better socio-economic background of parents who opt for shared custody, who are generally more educated and wealthier than other separated parents. In all other types of post-separation living arrangements (sole custody, step-families etc.), children have lower scores than children in two-parent families. However the magnitude of the coefficient is not large, and does not exceed one half standard error (for comparative purposes, coefficients across the parent's educational level are of around one standard error), except for very disadvantaged children living in a social institution.

Figure 1: Cognitive and non-cognitive test scores



We performed two types of panel regressions: random and individual fixed effects. Whereas random effect models with no controls confirm our descriptive findings that shared custody is positively associated with better cognitive results (in phonology, gap text, reading and reasoning), and negatively associated to self-confidence in school abilities, the addition of a large set of covariates renders some of the results non-significant (Table 2). However, a positive effect in phonology and reasoning and a negative effect in self-confidence remain. Thus, most of the advantage previously observed can be explained by observed child and household characteristics. The fixed effect model (Table 3) with time-varying covariates, confirms that children living in a shared custody arrangement after parental separation perform as well as those who live with their two biological parents in all cognitive skills. We still observe a lower score for child's confidence in their school abilities for children in shared custody, signalling that, although they do not score lower on cognitive tests, these children feel less confident in their capabilities at school. This might be linked to the organizational cost of living in two households that these children bear because of the frequent moves between parental homes.

All the other living arrangements show a negative correlation with school performance, in a first approach without any controls. In the random effects model, negative correlations in maths and encyclopaedic knowledge remain after controls are entered for children living with a single mother, with a mother and stepfather or single father with a step-mother. However, once unobserved fixed characteristics are accounted for in the fixed effect model, almost no detrimental effect of parental separation on cognitive skills is significant to the exception of children living with their father, whether they have a step-mother or not, in encyclopaedic knowledge. The trend is however different for non-cognitive outcomes. Children living with a single mother show significant less self-confidence in school matters than children living with their two biological parents.

We test a number of interactions: with the child sex, the presence of siblings, the sibship size, parental socio-economic status, and children's initial abilities (proxied by using school grades in mathematics and French in 2006). Parental separation appears to have a stronger impact on girls when it comes to the perceived self-efficacy measures of school ability and social interactions. The estimations show that the negative associations tend to be more pronounced for adolescents of highly educated parents, and for those with higher school grades at baseline. Children who already face more difficulties at baseline, either in terms of background socio-economic status or in school grades, are less impacted by the experience of parental separation, while children doing well before parental separation seem most impacted.

Table 2: Random effect models with controls, main effects.

	Phonology	Gap Text	Maths	Reading	Encyclop.	Reasoning	PSE School	Autoregulation	Social Interaction
Nuclear Family	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Shared Custody	0.077**	0.019	-0.001	0.020	-0.018	0.042	-0.230***	-0.044	-0.005
	(0.025)	(0.021)	(0.019)	(0.024)	(0.021)	(0.024)	(0.028)	(0.027)	(0.028)
Single Mother	-0.002	-0.011	-0.062***	-0.025	-0.028*	-0.023	-0.152***	-0.027	-0.034*
	(0.015)	(0.013)	(0.012)	(0.014)	(0.013)	(0.014)	(0.016)	(0.015)	(0.016)
Single Father	0.071	-0.017	-0.022	0.009	-0.059	-0.016	-0.129**	0.019	-0.023
	(0.039)	(0.033)	(0.029)	(0.038)	(0.033)	(0.038)	(0.044)	(0.043)	(0.044)
Mother & Step Father	-0.011	-0.038*	-0.075***	-0.022	-0.054**	-0.044*	-0.183***	-0.049*	-0.024
	(0.020)	(0.018)	(0.017)	(0.020)	(0.018)	(0.020)	(0.023)	(0.022)	(0.023)
Father & Step Mother	0.040	-0.066	-0.080*	-0.017	-0.136***	-0.055	-0.300***	-0.094	-0.059
	(0.048)	(0.040)	(0.036)	(0.045)	(0.040)	(0.046)	(0.054)	(0.051)	(0.053)
Observations	45086	45106	45150	45010	45144	44904	37940	42696	39816

Standard errors in parentheses. Controls: child's sex and age at entering secondary school, parity, parent highest education, language spoken at home, migrant status, household equivalised income, nb of coresident siblings, town size, type of school, located in a disadvantaged area.

Table 3: Fixed effect models with Controls, main effects.

	Phonology	Gap Text	Maths	Reading	Encyclop.	Reasoning	PSE School	Autoregulation	Social Interaction
Nuclear Family	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Shared Custody	0.056	-0.008	-0.013	-0.011	-0.033	0.009	-0.121**	-0.042	-0.056
	(0.042)	(0.031)	(0.025)	(0.040)	(0.030)	(0.038)	(0.046)	(0.053)	(0.046)
Single Mother	-0.059	-0.023	-0.027	-0.006	-0.010	-0.008	-0.082*	-0.064	-0.041
	(0.031)	(0.023)	(0.018)	(0.030)	(0.023)	(0.028)	(0.035)	(0.039)	(0.035)
Single Father	0.005	-0.019	0.025	0.001	-0.079	0.032	0.003	0.044	-0.053
	(0.060)	(0.044)	(0.036)	(0.058)	(0.044)	(0.055)	(0.068)	(0.077)	(0.068)
Mother & Step Father	-0.026	-0.016	-0.021	0.051	-0.012	-0.021	-0.100*	-0.024	-0.034
	(0.042)	(0.031)	(0.025)	(0.041)	(0.031)	(0.038)	(0.048)	(0.054)	(0.047)
Father & Step Mother	0.087	-0.061	-0.009	-0.000	-0.111*	0.022	-0.095	-0.026	-0.045
	(0.076)	(0.056)	(0.045)	(0.073)	(0.055)	(0.069)	(0.086)	(0.096)	(0.084)
Observations	45086	45106	45150	45010	45144	44904	37940	42696	39816

Standard errors in parentheses. Time-varying controls: household equivalised income, number of coresident siblings, town size, type of school :public/private), located in a disadvantaged area. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Conclusions

In this fixed effects framework using representative data from France, we find that parental separation has a small detrimental effect on adolescent outcomes, at least in the short term. Most of the differences across different family living arrangements in descriptive analyses are almost entirely explained by compositional and selection effects. This is in line with a recent meta-analysis by McLanahan et al. (2013), who shows that fixed effects estimations generate mixed and/or insignificant regression results. The results highlight the importance of pre-existing observable socioeconomic family characteristics as well as unobservable characteristics when determining subsequent child trajectories. The most stable patterns concern the negative effects of family change on perceived self-efficacy in school. The estimated coefficients of -0.1 to -0.2 are located in the lower range of effect sizes reported in meta-analyses of the literature (Amato 2001).

Our data allowed us to explore whether these general trends varied across different types of post-separation living arrangements. Our descriptive results confirmed that families choosing shared custody are still a select group of advantaged parents, and this advantage explained the higher cognitive scores of their children. However, in a fixed effect framework, there were no significant differences between children in a shared custody than those still living with both parents for cognitive skills; this applied to all post-separation living arrangements. A small negative effect on non-cognitive well-being, for self-confidence in school abilities, remained, for three living arrangements (shared custody, single mother, and mother with a step-parent).

Where significant differences did remain was in subgroup analyses: children who were more disadvantaged before separation, whether because of lower household socio-economic background or their own school grades, appeared to have "less to lose" and therefore, in this group, the negative associations between parental separation and cognitive skills tended to be less pronounced. This finding could speak to previous research suggesting that children in more conflictual households could actually benefit from separation if it permits them to escape difficult situations (Amato et al. 1995). Overall, our results allow suggest that, in France, separation has only a small negative impact on adolescent non-cognitive well-being; that post-separation living arrangements do not seem to impact much subsequent child well-being; while pre-separation child and household capital seems to be more important in understanding how children are impacted by parental separation.

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Appendix: description of the cognitive and non-cognitive outcomes used.

Cognitive skills

Phonology: The first session included a test of phonological knowledge. For example, students had to choose the phonological outlier of the following set of words: "fer, aimer, verre, amer, hiver" (Trosseille et al. 2013).

Gap text: This test examined a student's ability to understand the structure of a given text, semantic knowledge as well as vocabulary. For example, the following gaps had to be filled in: "Septembre! C'est le mois . . . choisit l'hirondelle pour partir vers le sud du Sahara . . . elle peut passer l'hiver au chaud" (Trosseille et al. 2013).

Mathematics: The maths test consisted of a variety of problems ranging from mental arithmetic, calculating with time and other units to geometry and logical problems. For example, a mental arithmetic problem would ask a student to solve: 65 – 30 = . . . (Trosseille et al. 2013). Reading comprehension: This tests asked students to read a total of three short texts of about 50 words each followed by five questions per text. The test takers were allowed to consult the text while answering the questions, but the amount of time for the whole exercise was limited (Trosseille et al. 2013).

Encyclopaedic knowledge: The sixth task examined a student's encyclopaedic knowledge based on the six different topics geography, history, biology, physics, maths and French. The multiple choice questions offered four potential answers, one of them giving the student the possibility to indicate that he/she does not know. In total, 8 questions had to be answered per topic. For example, in the field of geography one had to tick off the right answer among the following: "Cordillères des Andes: a) desert, b) lac, c) montagne, d) je ne sais pas" (Lieury et al. 2013).

Reasoning: This test aimed at measuring the students' logical reasoning ability using playing cards with values going from one to ten. A total of 30 problems had to be solved within 20 minutes. The task consisted of finding the correct value of a card that was turned upside down so that the proposed series continued in a logical way. For example: 2, 4, 6, xx (Trosseille et al. 2013).

Non cognitive skills

Feeling of self-efficacy: This task consisted of answering 37 questions about the personal feeling of self-efficacy based on the work by Bandura (1990). These 37 items. For example, the students were asked to indicate to what extent they agree with the statement: "Do you feel capable of succeeding in maths?" on a scale from 1 (Not at all) to 5 (I (almost) always do). Using principal component analysis (PCA, varimax rotation) three underlying factors were identified: *perceived self-efficacy in school*, *in social life* and *in terms of autoregulation*. The most representative question for the perceived self-efficacy in school asked about the capability of focusing on schoolwork. For the perceived social self-efficacy the question about the capability of making new friends proved most informative. The item about the ability to resist peer pressure to start smoking or drinking alcohol turned out to be most representative for the autoregulation score (Blanchard et al. 2013).